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USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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USSR REPORT

CONSTRUCTION AND RELATED INDUSTRIES

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CONSTRUCTION PLANNING AND ECONOMICS

FINANCE MINISTRY OFFICIAL ON MOBILIZING CONSTRUCTION RESERVES

Moscow FINANSY SSSR in Russian No 5, May 86 pp 11-19

[Article by A. V. Brezhenko, Chief of the Construction-Financing Administration and member of the USSR Minfin [Ministry of Finance] Collegium: "Intensify Monitoring Over the Mobilization of Construction Reserves"]

[Text] As a result of realization of the Communist Party's strategy for the 11th Five-Year Plan, definite positive advances have been made in all branches of the national economy. The construction industry has been further developed, enabling it to solve major social and economic problems. During the 11th Five-Year Plan, fixed capital worth a total of more than 800 billion rubles, 21 percent more than during the 10th Five-Year Plan, was introduced through all financing resources. Introductions included units of production capacity and facilities for the fuel-and-power complex, machinebuilding, ferrous and nonferrous metallurgy, light industry, the food industry and the agroindustrial complex. Housing was built on a large scale.

At the same time, as the 27th CPSU Congress noted, the state of affairs in the construction branch causes serious concern. The construction ministries are dispersing their resources and funds over numerous jobs, stretching out construction periods, overcoming but slowly deficiencies that prevent the construction program and plans for introducing industrial capacity and facilities into operation from being carried out successfully, and they have not managed to restructure the work aimed at a substantial rise in the branch's labor productivity and overall economic effectiveness.

Many construction organizations are violating state planning and financial discipline and have not insured observance of a strict savings and thriftiness program and the introduction of genuine cost accounting in construction. Many construction organizations have not met the prescribed goals and are allowing irrational use of material resources, losses of worktime, and unmonitored wage-fund expenditures. In the first 4 years alone of the 11th Five-Year Plan, USSR Mintyazhstroy [Ministry of Heavy and Transport Machinebuilding], USSR Minpromstroy [Ministry of Industrial Construction], USSR Minstroy [Ministry of Construction], Minvostokstroy [Ministry of Construction in the Far East and the Transbaykal Regions], USSR Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], and USSR Minenergo [Ministry of Power and Electrification] were in arrears to the state 0.8 billion rubles of profit (relative to contracting activity), which was

12 percent of their plans. Each year shortages of in-house working capital are permitted. This shortage ranged from 0.7 to 1.4 billion rubles for organizations of Union subordination for the construction ministries alone.

Prior to conversion to the new budget-estimate norms and prices, many economists explained the nonfulfillment of prime-cost and profit-plan goals, as well as the existence of losses, by the basic imperfection of budget-estimate prices. There were definite bases for such contentions. However, experience has shown that the main cause of unprofitable work and nonfulfillment of profit plans lies in unsatisfactory organization of construction work, deficiencies in economic planning and financial work, an irrational structure of the construction administration, and slowness in restructuring the system for setting norms and wages.

Since 1 January 1984, new budget-estimate norms and prices which consider the level of wholesale prices for industrial output and of rates for electricity and heat energy have been introduced into construction, new norms for overhead costs have been set, and the norms for planned accumulations have been raised greatly. In essence, the so-called objective causes for the unprofitable activity of many construction and installing organizations have been eliminated and the prerequisites for raising the overall profitability of construction performance have been created. Meanwhile, as already stated, many construction organizations did not carry out the profit plan or were unprofitable even under these conditions. In 1985 more than a third of the construction organizations did not fulfill the profit plan, and the number that were unprofitable, while reduced somewhat from preceding years, was still substantial, for on 1 October 1985 it was 22 percent of the total number of construction organizations.

The CPSU Central Committee and USSR Council of Ministers required ministries and agencies to adopt in 1984-1985 measures for eliminating planned unprofitability of construction organizations, mainly by consolidating them, reducing overhead costs and increasing labor productivity. However, the number of contracting organizations whose financial plans envision losses from economic activity are still substantial. In 1985 planned losses were envisioned for more than 13 percent of construction organizations, 22 percent in Minvostokstroy and 18 percent in USSR Mintyazhstroy. This indicated that the ministries have not done the appropriate work to eliminate planned unprofitability and in many cases have not taken specific steps to support a rise in construction-organization profitability. The cited data also confirms that budget-estimate prices alone are not the cause of unprofitable operation.

In order to increase profit and, on that basis, to provide for a further strengthening of cost accounting in construction, it is necessary to develop active measures for reducing the prime cost of construction and installing operations by intensifying the savings program, making more rational use of building materials, machinery and mechanisms, eliminating unproductive expenditures and losses, and observing unconditionally state planning and financial discipline. Given the modern scale of capital construciton, reducing the prime cost of construction and installing work by even 1 percent will enable more than 800 million rubles to be saved annually.

Let us examine the basic elements of construction costs that make up the prime cost of construction and installing work done, their effect on construction-organization activity results, and the reserves for reducing the prime cost.

A decisive prerequisite for promoting construction work and reducing the prime cost of construction and installing operations is growth in labor productivity. During the 11th Five-Year Plan the entire growth in construction-work volume should have been supplied by labor-productivity growth. However, the goals for this indicator were not met. For the five-year plan as a whole, labor productivity in construction should have grown 15 percent, whereas it actually grew only 13.7 percent. In so doing, the number of organizations that did not meet the plan for output per worker is not decreasing but is increasing. During 1984, 36 percent of the primary organizations did not cope, while in the first 9 months of 1985, 42 percent did not.

Factors that hamper labor productivity growth include unsatisfactory use of the pool of construction machinery and mechanisms, inadequate provisioning of various types of them, including supplying of small mechanized equipment. Moreover, the construction-machinery pool's structure is not being improved, the average power of the machinery does not increase greatly, and there are many obsolete machines with expired service dates.

At present, machines of small power and productivity predominate in the production of the basic types of construction machinery. The replaceable working equipment that is delivered with excavators, cranes and loaders is limited in variety, and this fact reduces their utilization effectiveness. With construction being supplied, on the average, with small mechanized equipment and power tools at the 45-60 percent level, the problem of equipping it fully with small mechanized equipment and with power tools is being solved extremely slowly. Because of this, many labor-intensive operations are performed manually. Altogether in construction, about 50 percent of the blue-collar workers are engaged in manual labor; this is much more than in other branches of the national economy. The share of manual labor in finishing work and in earthmoving and concreting operations is large.

At the same time, as has already been stated, the existing construction equipment pool is not being used effectively enough. During the 11th Five-Year Plan the output per basic construction machine and mechanism practically did not grow. At many construction sites, machines and mechanisms operated no more than 10-12 hours per day, with some mechanisms operating less than a full shift. The shiftwork factor of machinery and mechanisms for various construction ministries has not increased for a long time and a reduction of this indicator even has been tolerated for basic types of equipment. Thus, while the workday for crawler cranes in USSR Mintyazhstroy organizations averaged 15.5 hours in 1976 and 14.5 hours in 1985, it averaged 12.1 and 11.6 hours, respectively, for single-bucket excavators and 12 and 11.5 hours, respectively, for bulldozers.

In the first half of 1985 USSR Minpromstroy and Minvostokstroy organizations alone made the output per basic construction machine grow by an average of 4-6 percent. The output per excavator and pillar crane during installing

work in USSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] and the output per excavator and pillar crane in USSR Minstroy organizations were reduced. The real productivity of concrete pumps in USSR Minenergo and USSR Mintyazhstroy organizations was 2.5-fold below the designed level. According to the data of selective checks, idle time of machinery and mechanisms within shifts in the first half of 1985 was 17.8 percent of the time worked in organizations of USSR Minenergo, 17.5 percent for those of Minneftegazstroy, 16.4 percent for those of Minvostokstroy and 14.7 percent for those of USSR Minpromstroy.

The construction machinery fleet is being updated slowly, and the equipment that arrives at the projects does not always meet the demands of technical progress. At present, more than 26 percent of the pipelaying cranes, 33 percent of the pillar cranes, 35 percent of the excavators, and 27 percent of the scrapers are operating with expired service lives. The situation is similar in all the construction ministries.

A rise in the productivity of construction machinery and mechanisms, an increase in their power, and more complete equipping of construction projects with new and progressive machinery and mechanisms are the main reserves for labor productivity growth in construction. At the same time, the share of new machines for construction work and for equipping industrial enterprises of the construction and building-materials industries that are being developed under the state plan for promoting science and technology in the total output volume of construction and road machinery by Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] still does not exceed 2 percent. The new machines are being manufactured in small lots and do not affect labor productivity growth in construction considerably. A substantial portion of the equipment that is produced serially by Minstroydormash enterprises is inferior in its technical level to the best domestic and foreign models.

One of the causes of the unsatisfactory use of construction equipment is the failure to supply it with spare parts. Less than 50 percent of the standard requirements for spare parts for construction and roadbuilding machines are being produced. As a result, the idle time of construction equipment during repair and while awaiting repair is about a fourth of the worktime.

Along with the objective causes, major deficiencies in organizing labor and the construction process and in managing the construction organizations themselves affect adversely the meeting of labor-productivity goals. The brigade contract, which permits reserves for raising labor productivity to be found and which motivates workers toward the timely introduction of production capacity and facilities into operation and toward the elimination of worktime losses, is being used poorly. According to accounting data, more than half of the volume of contracting operations within the system of the general-construction ministries is being carried out by the forces of cost-accounting brigades. Judging by this data, matters are going well with introduction of the brigade contact into construction. But meanwhile, inspections testify that there are serious violations of cost-accounting principles in brigade activity. In many cases, nonintegrated and small cost-accounting brigades are being created which frequently are charged with doing one-time

jobs or different types of operations. The work results of these brigades dc not have a positive effect on the dates that facilities being built are put into operation or on meeting the goals for labor-productivity growth.

Because of serious deficiencies in organizing the brigade contact, the brigades created are experiencing nonproductive time and often are dispersed. In 1984 the fulfillment of 183 contracts (10 percent of the total) failed in Minvostokstroy. In Sayantyazhstroy [Sayanskiy Heavy-Industry Construction Trust] of Glavkrasnoyarskstroy [Main Administration for Construction in Krasnoyarskiy Kray] of USSR Mintyazhstroy, contract terms were violated in 12 out of 18 brigades that transferred to the contract in 1984, as a result of sending these brigades to other jobs and of supplying the jobs poorly with materials. The required work is not being done to consolidate brigades which will allow creation of the potential for one brigade to execute technologically complete construction jobs or build a facility as a whole. The engineers and technicians needed to perform the preparatory engineering operations still are not being included in these brigades.

The flow-line brigade contract under the plant-to-outfitting-to-transport-to construction job method is not being used in practice as a reserve for further increasing the effectiveness of construction work and as a material incentive for workers toward the final results of the work.

Worktime losses, which have not been reduced for a long time, are a major reserve for labor-productivity growth in construction. Worktime losses because of work avoidance, idle time and absenteeism involving failure to report for work with administration authorization lead to underfulfillment of the plans for construction and installing work volume.

Nonproduction expenditures caused by violations of the standard technology for performing construction, by the unsatisfactory quality of construction and installing work, which involve making changes and eliminating defects, by incomplete factory preparation of parts, articles and structure that arrive at the job, by design changes made during the construction process, and by errors and defects in the detailed designs also are not, in essence, being reduced. Nonproductive expenditures in recent years have come to about 1 billion rubles, or 1.5 percent of the planned prime cost.

A broad network of specialized orgtekhstroys [state trusts for the industrialization of construction work], which are called upon to engage in proper engineering and economic support and are intended primarily to raise labor productivity in construction, has been created in the country. They have been charged with the responsibility for introducing the achievements of scientific and technical progress and developing designs for performing construction and installing operations, for construction-work technology, and for scientific organization of work. They should also extend technical assistance to construction projects and to construction-industry enterprises. However, the orgtekhstroys are still spending a large amount of time on activity not inherent to their mission. Often they do the work of the management-organ staff--collect current data and make up various reports, prepare plan drafts and data for meetings of ministry collegia and main administrations, and so on.

The share of developments aimed at introducing progressive work forms and methods and the comprehensive mechanization of labor-intensive processes, which should help to raise labor productivity, is low in the orgtekhstroy's thesis-type plans.

The elimination of the deficiencies in organizing construction operations and in using construction equipment that exist in construction work, and also the full execution of measures for further industrializing construction operations that the party and government developed are major reserves for raising labor productivity and the branch's overall effectiveness.

Construction organizations and enterprises have not taken the proper measures to realize the principles of the CPSU Central Committee and USSR Council of Ministers Decree of 29 April 1984 on strengthening cost-accounting principles in construction and on observing the savings program. Despite the fact that plans for the prime cost of construction and installing work were basically fulfilled in 1985 by the construction ministries, the number of organizations that permitted planned costs of operations to rise are still large. In the first half of 1985 the planned prime cost of construction and installing work was exceeded by 40 percent of the country's construction organizations. The sum of the excess was about 1 billion rubles. In this connection, the problem of saving construction materials becomes especially urgent since they make up more than half of all expenditures for the performance of construction and installing operations.

In solving the problem, it is necessary simultaneously to reach the following goals: first, for consumption of the allocated building materials strictly within the norms and budget-estimate costs; and second, for reduction of the cost of construction and installing work by introducing into construction operations more economical and effective materials and advanced methods for doing the work, and by replacing traditional building materials.

As reports of investigations indicate, the major portion of construction organizations have not managed to change radically their approach to the use of building materials. Production norms for material consumption frequently are not observed because of deficiencies in organizing construction work and supply, deviations from design solutions, noncorrespondence of varieties, brands and quality of the items and parts delivered with the designs, specifications, standards; and so on.

Overconsumption of materials is permitted as a result of work done over again, the correction of defects, and "completions" at facilities already turned over to the customers. During the first four years of the 11th Five-Year Plan, USSR Mintyazhstroy construction organizations expended above the production norms 61,900 tons of rolled ferrous metal, 43,000 m^3 of timber and lumber, 103,000 tons of cement, 1,093,000 m^3 of cement-using concrete and mortar, 984,000 m^2 of glass, and many other materials in short supply. The situation was similar also in 1985.

According to USSR Minstroy's inspecting organizations, overconsumption of the production norms in 1984 was: 6,800 m^2 of construction glass (1.9 percent of the amount expended), 1,332 m^2 of linoleum (6.3 percent), 1,533.9 m^3

of ready-mix concrete (6.0 percent), 7,347 tons of construction mortar (3.9 percent), 636,000 standard equivalent units of construction brick (6.6 percent), and so on. Three-fourths of the overexpenditure of construction mortar and almost all the brick used above the norm went to eliminating defects and to reaccomplishing work. Calculations indicate that elimination of the overconsumption of materials above the production norms would enable the general-construction ministries to provide resources for about 1 billion rubles' worth of additional construction and installing operations.

Violations of the established procedure for accounting for and writing off material valuables during production operations still are not rare at construction projects, neglect in accounting has not been eliminated, and cases of writing off materials at facilities turned over in preceding years occur. A check conducted at the Karsha SU-2 [Construction Administration No 2] of Construction Trust No 13 of Uzbek SSR Minstroy established a write-off for loss of materials costing 75,500 rubles at seven facilities that were turned over in past years.

In many cases materials are written off 2-3 months later, a fact that distorts accountability. The report on the consumption of basic building materials (Form M-29) is not made up in many organizations, hampering the monitoring of the observance of production-consumption norms. Yet this form had been introduced with a view to imposing proper order in the procedure for the consumption of building materials. Experience indicates that in those organizations where the proper procedure for accounting and reporting is adhered to, all paths for irrational and wasteful use of materials are closed.

Many construction organizations have an irresponsible attitude toward ensuring the safety of materials and violate the rules for hauling, storing and protecting them. They are frequently stored in a heap under the open sky. Doing so leads to deterioration and the impossibility of making further use of them and causes substantial harm to the national economy. As inspection reports indicate, in some cases cement is hauled in open vehicles. At construction sites cement of different grades is commingled, because of which its rating is degraded, construction costs are increased, and work quality is diminished. At SMU-2 [Construction and Installing Administration No 2] of Kirovpromstroy [Kirov Industrial-Construction Trust] of the Kirov TUS, bricks were stored in a heap at the Avtobaz facility, and at the Masterskiye facility they were stored under the open sky without observance of the rules for storage.

One of the reasons for the increasing expensiveness of materials is an excess of the costs for preparing them, primarily because of nonobservance of transport schemes for bringing them in. In checking the expenditures of USSR Mintyazhstroy construction organizations for hauling freight by automotive transport for about 594 construction jobs, reporting revealed excessive haulage in the amount of 8.4 million ton-kilometers, causing 736,000 rubles to be charged to the prime cost of haulage, which is 10.6 percent of the total expenditures for freight hauling for these construction projects. For Trust No 1 of Glavulyanovskstroy [Main Administration for Construction in Ulyanovsk Oblast] of USSR Minstroy, the increase in the cost of materials was 61,000 rubles as a result of the importation of materials to intermediate storage facilities and an increase in the distance of haulage versus the distance set in the budget estimate, as well as of transshipping of the freight. In

SMU-8 of Trust No 1 of Kirghiz SSR Minstroy, nonobservance of the transport scheme for bringing in supplies and repeated transshipments caused costs to increase 64,000 rubles. The data cited indicate that, as a result of violations of the procedure for bringing materials in, the national economy suffers great losses. But indeed no additional funds are required for eliminating such violations. The proper procedure for the matter must be imposed at each construction project.

Great harm is done to the national economy when the required measures are not taken for protecting socialist property and wastefulness and extravagance are not stopped. According to accounting data, the sum of shortages, misappropriations and damage of valuables came to about 15 million rubles in 1984. Meanwhile, a substantial portion of the harm through shortages, misappropriations and damage of valuables is not exacted from the guilty parties but is written off as losses or is charged to production outlays. Thus, in 1984 the total indebtedness charged against the guilty parties and written off as losses and charged to production outlays was 87 percent for USSR Minstroy and 80 percent for USSR Mintyazhstroy.

The grossest violation of state discipline is the release of allocated and scarce materials to outside organizations and private parties. Savings of material resources in the national economy can be intensified only if there is precise organization of all-embracing monitoring over their consumption, improvement of the system for accounting, reporting and analysis, and tireless discovery and elimination of all types of nonproductive expenditures and losses.

Today the established procedure for accounting for and for writing off materials is not being observed at many construction projects. Inspections have disclosed numerous cases of neglect in accounting, untimely formulation of documents for writing off materials, failure to compare the date of bookkeeping and storage accounts regularly, and an absence of monthly inventorying of materials in open storage.

All this creates possibilities for the unmonitored consumption of material valuables and leads to squandering and misappropriations. Such a situation is intolerable, especially where contracting organizations have accumulated materials of various types in amounts that greatly exceed the established standards.

Above-standard reserves of commodities and material valuables occurred in all the construction ministries in 1984. They were 20 percent of the standard in Minneftegazstroy, 18 percent in Mintransstroy [Ministry of Transport Construction], 15 percent in USSR Mintyazhstroy and 14 percent in Minvostokstroy. As inspections indicate, along with other factors, an accumulation of above-standard reserves occurs because of incomplete outfitting in the shipment of building materials and structure (mainly by enterprises of the in-house production base) and also as a result of the importation thereof without taking the actual requirement into account. About 60 percent of the unplanned reserves were formed as a result of this. In light of the requirements for accelerating the rate of turnover of working capital by construction ministries, it is necessary to get from subordinate organizations

greater flexibility in the use of above-standard commodities and material valuables that have accumulated at storage facilities.

Reduction of the prime cost of construction and installing work depends greatly upon the introduction into production work of new and progressive constructional structure and decorating materials. Meanwhile, the share of these materials in the total output of USSR Minstroymaterialov [Ministry of Construction Materials Industry], the main supplier of building materials, is only 8-10 percent.

The construction ministries, when experiencing difficulties in being provided with certain types of materials, especially progressive structure and parts, do not pay enough attention to making maximal use of existing production capacity and to developing the in-house production base. Each year during the 11th Five-Year Plan the general construction ministries did not ensure the introduction into operation of production capacity and of fixed capital of their in-house production bases, and plants for making metal structure were erected over periods much longer than had been prescribed. The Pervouralsk Constructional-Structure Plant, the Kansk Lightweight Metal Structure Plant and other USSR Minmontazhspetsstroy facilities whose production is acutely necessary for reducing the time taken to build facilities for the national economy and for cutting the prime costs thereof have been under construction for more than 10 years. The construction and introduction into operation of a number of facilities for the production bases of USSR Minpromstroy and USSR Mintyazhstroy have been delayed.

The successful solution of the problems of speeding up scientific and technical progress in the branch will depend greatly upon the skill of construction organizations in focusing attention on completing the erection of in-house production facilities as quickly as possible. In so doing, the main emphasis must be placed on the reequipping of existing enterprises and on preparing them for the output of the most progressive structure and parts, machinery and mechanisms, and tools and other output that will enable the technical level of construction production to be greatly raised and on sharply curtailing the use of manual labor and the prime cost of construction and installing work.

The CPSU Central Committee and USSR Council of Ministers decree on the matter of the further development of industrialization and a rise in the labor productivity in construction that was adopted in August 1985 contemplated organizational and technical measures for speeding up scientific and technical progress in the branch.

Raising the industrialization of capital construction to a qualitatively new level, reequipping the branch with machinery, and expanding the volume of production of integrated buildings and structures and of progressive building materials and structure are called for. It is planned to increase considerably the scale of use of polymers and other chemical products in construction. Goals have been set for supplying construction better with the necessary equipment and powered tools.

A great increase in the prime cost of construction and installing work occurs as a result of the uneconomical expenditure of wage funds. In many

construction organizations, monitoring observance of the ratio between the rate of growth of labor productivity and the rate of growth of the average wage fund has been weakened and responsibility for overexpenditure of wage funds has been reduced. About 10,000 contracting construction and installing organizations of the 7 construction ministries, or 41 percent of the total number, violated in the first half of 1985 the economically justified ratios of rate of growth of labor productivity and of the average wage, a fact that led to wage-fund overexpenditure in the amount of about 59 million rubles.

Where there is systematic nonfulfillment of tasks set for labor-productivity growth, the supervisors of many construction organizations support growth of the average wage by means of concealed and open markups in job orders. Checks of Mintyazhstroy organizations show that during the 11th Five-Year Plan an annual average of 13.8 percent of the added wage fund under job orders constituted excessive pay for workers. During the first 9 months of 1985 USSR Stroybank institutions found excessive pay in 397 organizations in the amount of 8.2 million rubles, which is 12.2 percent of the wage obtained by workers during this period.

During construction, deviations from the designed technology for performing the work frequently are committed, also causing overexpenditure of pay. At 33 USSR Mintyazhstroy construction projects that were checked, actual labor expenditures for doing construction and installing work rose by one-third over the norm because of violations of the work plan, increasing pay costs by 27 percent.

The results of a 1985 USSR Stroybank check on work organization at 48 of the most important Mintyazhstroy jobs that were due for early startup indicated that almost 80 percent of them are being built under work plans that do not meet the requirements of the construction norms and regulations. It is pertinent, in this connection, to state once more the role of the orgtekhstroys. We still have not managed to organize the work of these trusts in a way that will completely eliminate the possibility of similar situations arising.

Among the causes of nonproductive expenditure of labor is the low quality and inadequate factory finishing of products that are supplied to construction. According to the data of selective checks made by USSR Gosstroy, prefabricated reinforced-concrete articles and structure are shipped by a number of enterprises with the surfaces unprepared for painting and with substantial deviations from the sizes established by the standards. Window and door units often are shipped unpainted, unglazed and without weather stripping. Much additional labor must be expended directly at the construction sites to bring this output up to the required condition.

In accordance with the USSR Council of Ministers and AUCCTU decree of 24 January 1985 about improving organization of the system for pay and work incentives within construction organizations, it was necessary to take steps to convert gradually to calculating wages for the work performed on the basis of the construction budget estimate. Construction ministries and agencies are still slow in implementing measures for propagating progressive forms for organizing and motivating labor. More effort should be spent to improve

the setting of labor norms and to develop and apply consolidated and integrated norms for construction and installing work. This will enable use of the piecework system for pay in accordance with the final result to be supported and unjustified payments to be reduced and, eventually, eliminated. It is time, finally, to stop basing wage-fund formation on the prevailing level and to convert to planning it on the bases of the standard labor expenditure and wages for workers engaged in construction and installing work that are allocated in the budget estimate for the construction of enterprises, buildings and structures. The execution of these measures, in combination with other measures, will enable the responsibility of construction-organization supervisors for use of the wage fund to be increased.

A sizeable reserve for reducing the prime costs of construction and installing work is the saving of overhead costs. Overexpenditures on overhead comprises a substantial share in the total increase in prime costs of construction and installing work. Thus in 1984, when it was planned to reduce prime costs for construction and installing work by contracting organizations throughout the national economy as a whole by 11.3 million rubles, overhead overexpenditures were 345 million rubles, and in the first 9 months of 1985 these sums equaled, respectively, 378.5 million and 208 million rubles. One of the basic reasons for the excess over the established norm for overhead expenditures is imperfection of the construction-management structure. As a rule it is cumbersome, it is 3-level, 4-level and even 5-level in nature. Many organizations have insignificant amounts of work. At present about 20 percent of the construction organizations do less than 1.2 million rubles' worth of construction and installing work annually. Basically these are small organizations that cannot build with economic effectiveness. All of them are unprofitable, as a rule, because of exceeding the overhead expenditure norms.

In the new schemes for control being developed by the ministries, there are no proposals for simplifying it, the prospects for developing the mobile method of organizing construction are not being determined, and the question of an association of small construction organizations is being resolved but slowly. In areas where the construction ministries are performing operations, many small construction organizations of nonconstruction ministries are operating simultaneously with them. Thus, in Kalinin Oblast, beside USSR Minstroy and specialized construction ministries, 103 construction organizations of other ministries and agencies are performing work.

Already for the second year, contracting organizations are operating under the guidance of the principles of the CPSU Central Committee and USSR Council of Ministers Decree, "Improvement of the Planning, Organization and Management of Capital Construction," and of other decisions on capital construction questions, which call for a set of measures aimed at raising production effectiveness, reducing construction time, meeting the goals for profit, and reducing unprofitability and prime operating costs, based upon improvement of the organizational structure of construction management and the consolidation of construction organizations.

The introduction of new elements of the economic mechanism necessitates creation of the economic prerequisites for improving the financial and

economic indicators of construction-ministry activity and for greatly increasing the efficiency of construction operations.

The decisions of the 27th CPSU Congress require the builders to work to consolidate organizations and to reduce excessive levels of management and develop its most progressive forms. A system of measures for executing these decisions should be well thought-out.

Construction ministries and agencies must systematically and persistently implement the measures that party and government contemplate for improving the state of affairs in capital construction and must consider an increase in the effectiveness of construction operations by reducing the prime cost of construction and installing work and by increasing labor productivity as among the most important tasks in developing the Soviet state's economy.

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CONSTRUCTION PLANNING AND ECONOMICS

GOSSTROY CONFERENCE DEFINES NEW TASKS TO INDUSTRIALIZE CONSTRUCTION

Moscow BYULLETIN STROITELNOY TEKHNIKI in Russian No 3, Mar 86 pp 30-32

[Article by E.E. Kiyevskaya, candidate of technical sciences, academic secretary of the Scientific Coordinating Council of Gosstroy USSR, and S.V. Nenakhov, expert of Glavstroynauka, Gosstroy USSR: "Conferences, Meetings, Seminars: Conference On Enhancing the Industrialization of Construction"]

[Text] At Gosstroy USSR's Central Scientific Research and Experimental Design Institute of Construction Organization, Mechanization and Technical Assistance [TsNIIOMTP], there was a joint meeting of the Gosstroy Scientific Coordinating Council on organization, technology and mechanization of construction work and the Section On Construction Organization and Technology of the Central Bureau of the Stroyindustriya Scientific and Technical Society. Scientists and specialists of the construction ministries, scientific research and design organizations and institutions of higher education took part in this meeting. The meeting discussed the basic directions and the state of coordination of scientific research work to improve the level of industrialization and construction work during the 12th five-year period.

The acceleration of scientific and technical progress demands that the construction industry reach a new level of technical growth characterized by more industrialized work methods. The conference determined that the chief directions to be taken by the industrialization of construction were:

-- the transfer of part of the technological processes from construction sites to factories and into more stationary conditions to attain a higher level of prefabrication of erected buildings;

—achievement of higher technical level in construction design ideas and more fully standardize them;

-- mechanized line production of materials, parts and structures at factories or in the secondary work of construction organizations with a high degree of their construction readiness;

-- complete provision of materials, parts and structures according to schedules calling for continuous production of construction work;

-- mechanized mass performance of technological operations and processes in erecting buildings by means of using standard inventory resources providing the required quality and reducing labor-intensiveness and the length of the work cycle;

-- and economically feasible replacement at construction sites of temporary buildings and facilities with standard inventory facilities.

The conference noted that the "Composite coordinating plan for scientific research work on the most important problems of organization, technology, mechanization and automation of construction work" which was prepared by TsNIIOMTP in conjunction with other organizations and approved by the Scientific coordinating council of Gosstroy USSR includes the basic tasks for scientific research work and design work, the performance of which is aimed at accelerating the industrialization of construction work during the 12th five-year period.

The joint conference defined for scientific-research, design and construction organizations the following basic tasks in enhancing the level of industrialization of construction during the 12th five-year period:

a) In the area of design work:

-- improve the technical quality of construction designs, the basic indicators of which should be to reduce the general labor costs and especially manual labor, to reduce the amount of time consumed by basic processes and operations and to achieve more economically efficient designs;

-- intensify the standardization of building components and parts by using elements mass produced in factories using more efficient technologies such as extrusion, pressure casting, stamping and high-strength glueing processes;

-- complete the standardization of linear dimensions of monolithic constructions as the basis for standardizing linings and reinforcing materials;

-- develop standard designs for reinforcement of various types of structures.

b) In the area of construction work organization:

-- begin using a single construction preparation system based on state standards;

-- more deeply specialize construction organizations and their subdivisions;

-- improve forms of production and technological organization and provision to construction sites of materials, parts, prefabricated structures and engineering equipment in accordance with calendar and work schedules;

-- develop and introduce a total and per-unit construction of buildings and groups of buildings through the industrialized manufacture of prefabricated components and efficient methods for delivery and assembly of these components;

-- determine the rational areas in which mobile construction organizations can be utilized by creating and equipping them with mobile work resources;

-- utilize a principal method in the construction of large industrial complexes;

-- introduce methods for mass construction of buildings and groups of buildings.

c) In the area of mechanizing construction work:

-- to create complexes of machinery and technological equipment that can increase labor productivity by lowering the amount of manual labor and reducing the amount of time required to complete work;

-- to create new and nontraditional types and sizes of machinery (including mechanized tools) employing new methods of action;

-- to provide continuous operation of construction machinery by improving reliability as well as the methods and means used to operate that machinery.

d) In the area of construction technology:

-- to make an organized and orderly switch to using advanced technologies according to standards that will provide a active system of preparation for construction work;

-- to increase the amount of prefabricated components in buildings and groups of buildings by replacing poorly-designed buildings with built-in facilities and by using systems of industrial ventilation, sewage and heating;

-- to increase the degree of readiness for use of parts and structures and seeing that they are produced in their specified design dimensions according to an active system of manufacturing tolerances and requirements;

e) In the area of technology of the basic types of construction and assembly work:

1) Earth-moving work: the use of earth-moving, earth-moving and transport machinery and transport equipment of higher unit output; improvement of the technology used to prepare and pack soil including equipment operated under constraining conditions and using small packing and earth-moving machines and equipment for making trench-free communication strips; creation of equipment for mechanizing work in frozen soil; creation of material-conserving technologies for making vertical-wall excavations for natural gas and oil

pipelines; development of technology for wintertime laying and packing of bound soils in embankments.

2. Concrete-pouring work: for the erection of monolithic structures, building and edifices, use of complexes of mechanized equipment including special machinery for transportation of concrete, concrete pumps, concrete-pouring equipment, etc.; replacement of manual labor in auxiliary operations (attachment, cleaning transport equipment and containers and concrete spreading and curing) through the use of new types of technological equipment, attachment devices and new types of machinery for delivering and pouring concrete, use of new materials and linings with anti-adhesive properties; reduction of the consumption of all types of resources in wintertime concrete pouring through the use of hardening accelerators, utilization of efficient structures for thermo-active casings with new types of heat generators, efficient casing heaters, use of standard temporary heated shelters that employ efficient methods for heating up coarse and fine concrete filling material at concrete factories, use of heated concrete transport and pouring equipment; improvement of the quality and cost-effectiveness of concrete mixtures through replacement of all-purpose cement trucks with more specialized models.

3. Ferro-concrete work: increasing the use of standardized reinforcement by applying it to all categories of zero-cycle monolithic ferroconcrete structures; further development of centralized manufacture of commercial reinforcement by expanding existing reinforcement shops at construction-industry plants and reequipping these plants with fully-mechanized production lines, high-output equipment for the stockpiling and welding of reinforcement; use of mobile reinforcement stations, contact-welding manipulators, jigs for assembly of reinforcement, mobile contact-welding machines, mechanized tools for cutting and bending reinforcement; determining the areas in which welded joints can best be replaced with weld-free joints using locks and fasteners, use of contact welding in working joints as well as coupling joints connecting average- and large-diameter reinforcement.

4. Concrete form work: increasing the amount of typical forms manufactured at specialized plants; increasing the use of block, large-panel and rolling forms in order to mechanize their assembly and dismantling; development and use of special construction manipulators (robots) for assembly and dismantling of form elements; increasing the scale of use of nonremovable forms including those with special insulating properties which reduce the amount of work to protect the structure against corrosive fluids.

5. Finishing work: use of dry cement mixtures made of gypsum and special additives to form single-layer coatings to reduce the number of operations and the amount of work; use of rolled synthetic glass-reinforced materials for covering walls and laying floors and which can reduce labor costs by more than twice; use of shrink-free thixotropic finishing pastes that can in many cases eliminate painting; use of bloated sealing cements in place of caulks in operations to seal cracks and small holes; use of synthetic glues and caulks to seal the joints of rolled synthetic materials in surface-finishing work.

6. Floor laying: use of vibrotamping to eliminate manual labor in tamping in flooring plates and filling in the seams between them; laying of mosaic floors over concrete by means of vibrotamping mosaic coverings onto a vacuum-cleaned concrete surface without having to set up cement and sand coverings and by sharply reducing labor involved in polishing the surface; use of super-plasticizing agents in cement, mosaic and cement and sand mixtures for floor coverings to reduce labor costs in laying and sealing coverings; use of self-balancing coverings made of gypsum rather than cement and sand mixtures.

7. Roofing work: wide use of bituminous polymer glues for rolled roofing materials as well as fine-dispersion bituminous polymer emulsions for unrolled (mastic) roofing materials which therefore makes it possible to mechanize roofing work and at the same time more than double the service life of the material; industrializing preparatory and basic roofing work.

8. Prefabricated construction assembly: increasing the use of prefabricated structures and equipment in the construction of industrial facilities; use of conveyer assembly and block-assembly of the steel coverings of industrial buildings; use in connecting units of support structures, bolted joints and attachment devices that can provide positive installation of elements into their designed position; for attachment of support structures, engineering lines and equipment, use of self-anchoring unified attachment items that make it possible to eliminate laborious drilling of holes for attachment parts; expanding the use of light and efficient materials for removable partitions and walls including those made of cement chips, plaster and fiber, plaster and chips and plaster sheets as well as expanded clay aggregate concrete wall panels manufactured by form-free casting; development and use of unlooped methods for attaching structures; creation of manipulators for the assembly of light space-dividing structures.

9. Materials-handling and transport work: use of standard designs for containers and packing; creation of strapping package mechanisms as well as specialized automotive transport with built-in manipulator cranes for the handling of heavy loads.

All participants to scientific and design work to improve the organization, technology and mechanization of the construction industry should be guided by the basic principles above in establishing the basic directions for scientific research and in developing design tasks, organization of construction and schemes for construction and assembly work.

The conference recommended that ministries and departments whose scientific research organization are studying the organization, technology and mechanization of construction should use the "Composite coordinating plan for scientific research work on the most important problems of organization, technology, mechanization and automation of construction work" as the basis during the period 1986-1990
for formulating scientific and technical programs for the 12th 5-year period as well as yearly plans and the introduction of new equipment.

12261
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CONSTRUCTION PLANNING AND ECONOMICS

REVIEW OF BOOK ON ORGANIZATION OF REGIONAL CONSTRUCTION INDUSTRY

Moscow STROITELNYYE MATERIALY in Russian No 3, Mar 86 p 29

[Unsigned review of book "Regionalnye razvitiye stroitelnogo kompleksa" [Regional development of construction] by G.V. Torsh, Moscow, Stroyizdat, 1985 5000 copies, 44 pages]

[Text] The chief task of regional construction complexes is to provide construction organizations within the Soviet republics and economic regions a balance between their resources, forces and material and technical base and the volume of construction work within standard periods, reduce the time needed to complete construction projects, improve quality and reduce costs. They accelerate the growth of the construction industry and the production of construction materials, improve their technical quality and improve the structure of material resources by providing the construction industry with high-output equipment and small-scale mechanization and increase the production and use of progressive materials and structures. It is necessary to use internal reserves which in itself requires the improvement of administrative work. The existing administrative structure responsible for construction organizations and plants producing construction materials hinders further development of the construction complex. It has now become necessary to make fundamental changes aimed at creating a single territorial mechanism for administering the construction complex. The improvement of its work depends on adjacent industries, especially the construction and road-building machinery industries, ferrous and nonferrous metallurgy and the chemical and wood products industries which should provide construction with more progressive equipment, ferrous rolled stock, aluminum, synthetic materials, etc.

12261
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INDUSTRIAL CONSTRUCTION

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GOSSTROY INSTITUTE OFFICIAL ON NEW INDUSTRIAL ARCHITECTURE

Moscow PROMYSHLENNOYE STROITELSTVO in Russian No 4, Apr 86 pp 18-20

[Article by N.N. Kim, doctor of architecture, deputy director of TsNIIpromzdaniy of USSR Gosstroy: "Architectural Typology of Industrial Buildings--An Important Factor for Intensification of Construction and of Industrial Production"]

[Text] Architectural typology of industrial buildings won recognition as an independent and important branch of construction science relatively recently. The USSR Academy of Construction and Architecture, which existed until the sixties, had a ramified network of institutes for numerous engineering disciplines--TsNIISK, NIIZhB, TsNIIOMTP, NIISF, etc. The NII for Public Buildings and NII for Housing were concerned with architectural typology (the Industrial Buildings Sector of the NII for Public Buildings, whose director was I.N. Magidin, candidate of architecture, which had a staff of four, was unable, of course, to have a noticeable influence on this field of science and design). The first important research in the field of industrial buildings was related to the NII for Industrial Buildings, in which qualified industrial specialists were gathered together: V.V. Burgman, doctor of engineering sciences (the institute's director); V.A. Myslin (deputy director for scientific affairs); I.N. Magidin, candidate of architecture; V.M. Bazarnov, A.A. Khrustalev, V.V. Blokhin, B.V. Gladkov, M.Ye. Ostrovskiy, etc. But that institute lasted a short time; in 1958 it was moved to Sverdlovsk and for all practical purposes terminated its activity.

In 1959 a division of architectural typology for industrial construction began to take shape in the NII for Experimental Design (director B.R. Rubanenko). The first three departments were created: single-story buildings, whose director was M.Ye. Ostrovskiy, candidate of engineering sciences; multistory buildings, under the direction of N.N. Kim, candidate of architecture; and multipurpose industrial buildings, under the directorship of V.V. Burgman, director of engineering sciences, etc. Other departments within the industrial division were also created at a fast pace. The architects specializing in industrial buildings were brought closer together. Highly qualified architects began to move from the design institutes to this division: L.N. Sherman, Ya.Ya. Driving, N.A. Skobtsov, V.V. Khanykov, V.M. Lisitsyn, B.S. Klyuchevich, P.D. Viskina, A.I. Okunev, and others. The masters of Soviet industrial architecture--regular members of the USSR Academy of Construction and

Architecture I.S. Nikolayev, A.S. Fisenko, V.A. Myslin, and G.M. Orlov, provided vigorous assistance in the industrial division's evolution.

In little more than a year the division's staff reached more than 200. A decision of the Presidium of the USSR ASiA and USSR Gosstroy on 1 January 1961 created from this division the Central Scientific Research and Experimental Design Institute of Industrial Buildings and Installations (TsNIIpromzdaniy); K.N. Kartashov, candidate of engineering sciences, was named its director, and N.N. Kim, candidate of architecture, was named deputy director for scientific affairs.

The science of architectural typology in the field of industrial construction has been evolving on the scientific premises of the founders of Soviet industrial architecture. The "functional method," developed by A.A. and V.A. Vesnin and M.Ya. Ginzburg, stated the following requirement which architects must meet: "...to take part in creating new types of buildings, to combat eclecticism, to apply the most recent scientific-technical advances to architecture, to discover the esthetic capabilities of the new architecture, to fight for industrialization of the construction process, for standardization, for off-site manufacturing of components and for the transformation of the process of construction into the assembly of construction components," and so on.

The words of one of the founders of Soviet industrial architecture A.V. Kuznetsov (1874-1954) to the effect that "architecture represents a harmony between science and art" began to serve as the motto of industrial architects in general and of the research architects and scientists of TsNIIpromzdaniy in particular. Except that we added to this the word "technology": "Architecture is a harmony of science, technology, and art." The science of architectural typology in the institute confirms the loyalty that has been shown to this scientific doctrine over the past 25 years.

As TsNIIpromzdaniy has grown, the institute's basic directions and tasks have taken shape. The following are among the most important of them: the shaping of industrial centers and master plans of enterprises; improvement of the system of social services to the workers at enterprises; and architectural design and interior, which go under the general title of "esthetics of industrial buildings and installations." The institute solves problems in the architecture of enterprises in metallurgy, enterprises of the chemical and petrochemical industries, enterprises in machinebuilding, instrumentmaking and light industry, buildings constructed from lightweight metal fabrications and mobile (stock) buildings.

A period of 25 years is not very long for a new field of science to evolve. In that time the basic and most effective lines of research different from research in the architectural typology of civil engineering have been worked out, and a new method has been devised of conducting research jointly with industrial engineering institutes. In industrial construction the research architect, unlike architects in the civil field, have to master the laws of the functional organization of production and have to be familiar enough with the fundamentals of industrial engineering to arrive at new configurations together with the industrial engineer.

A qualified staff of architects has now finally taken shape in TsNIIpromzdaniy, and they are doing effective work in many fields of industrial architecture. Consequently, we can state confidently that the initial period of the evolution of the science of architectural typology has been completed. With respect to many directions of architectural typology the staff of architects, together with the industrial engineers, technicians, and engineers, provided effective results for the practice of construction design from the first years of the institute's creation. More than 150 sector institutes and specialized institutes have taken part in the development projects of architectural typology.

The socioeconomic effectiveness of the science of architectural typology and its relationship to the practice of industrial construction have been proven. As a field of architectural science the architectural typology of industrial buildings studies the distinctive features and discovers the patterns in shaping the form of various types of production and auxiliary buildings.

As is well known, production buildings must furnish the required operating modes for the production process and the optimum conditions for the work done by the people in them. The basis of the form of production buildings is above all their functional purpose, the diversity of which in present-day production, dictated by the scientific-technical revolution, is extremely great. The classification of the USSR Central Statistical Administration compiled exclusively by types of industrial products contains about 100 branches and groups of branches in the industrial sector, and there are several thousand different production operations.

A most important task of the architectural typology of industrial buidings is to provide for rapid modernization of the production process, the change of equipment, and the application of automated production control systems. It is extremely important in this connection to discover the patterns of technical progress in industrial engineering. Optimization of space designs and floor layouts to ensure functional longevity, flexibility, and versatility of production buildings must go in the direction of creating new configurations and types of buildings. Selection of ways of optimizing space designs and floor layouts of buildings with the necessary scientific substantiation and taking into account the patterns of change of technology can guarantee functional longevity, flexibility, and versatility of a building at minimum outlays of physical resources and money.

Jointly with design organizations of various ministries and departments the people in TsNIIpromzdaniy have developed progressive space designs and floor layouts for location of production operations in ferrous and nonferrous metallurgy, chlorine, nitrogen, and phosphorus plants, plastics plants, petrochemical installations with exposed equipment, machinebuilding and textile enterprises, and many other industrial construction projects. Practical application of these developments in design and construction has been providing an annual benefit on the scale of 15 to 25 million rubles, a 10-15-percent reduction of the size of the building site, a 10-15-percent reduction of labor inputs, a 25-35-percent reduction of the length of utility lines, and a 20-25-percent reduction in construction time.

Stepping up the pace of industrial construction, increasing the degree of industrialization of the construction process and the level of off-site manufacturing of structural fabrications and parts, dissemination of the practice of fully prefabricated construction and erection of buildings and installations from progressive fabrications are important factors that have an impact toward development of industrial architecture in the context of scientific-technical progress.

The institute has been involved in an innovative effort on the intersector standardization of industrial buildings that differ with respect to the conditions of production, which is the basis for standardization of structural components and parts of industrial buildings and installations for volume application.

Activation of fixed assets has speeded up, application of reinforced-concrete and concrete fabrications has been growing at a fast pace, reaching 120 million m^3 in 1984, as against 48 million m^3 in 1965. Architectural practice in the field of industrial construction has improved over that time. Design organizations and industrial architects have mastered rather quickly the specific features of designing projects under the new conditions and have often achieved integrated results in both the technical and creative fields. A system for standardization of the parameters of industrial buildings and installations for all sectors of the economy has been worked out and applied in design and construction practice. Specific projects have been designed on that basis, and major industrial complexes and architectural ensembles have been built.

We can cite as an example the Volga Motor Vehicle Plant, which has gone down in the history of Soviet industrial architecture as a project of high architectural expressiveness achieved with simple and crisp architectural shapes in the context of a high degree of industrialization of structural elements and the integrated solution of civil engineering and social problems (architects Ya.M. Zhukov, M.M. Melamed, and D.L. Chetyrkin). Widespread recognition has been won by the architecture of the Bratskaya (architects G.M. Orlov, Yu.N. Gumberg, and others), Krasnoyarskaya (architects A.I. Goritskiy, G.S. Nikulin), Ust-Ilimskaya (architects A.M. Belskiy, Ye.A. Pershanin, and others) hydropower stations, the "Pravda" newspaper production complex in Moscow (architects P.I. Alekseyev, Ye.M. Gutkin, K.L. Dyshko). The following enterprises stand out for their good architectural features: the Kaunas Rayon Plant, the Chelyabinsk Shaped Steel Decking Plant, garment factories in Tashkent and Kerch, and many others.

It is not possible in the space of this article to examine in detail the architectural designs of these projects, but there is one thing they have in common--all the projects were made from industrial fabrications. At the same time the creative exploration of architects and construction engineers produced a quality and economical architectural design. Yet in architectural practice in the field of industrial construction there are still sizable deficiencies that make construction more expensive and result in inefficient utilization of natural, physical, labor, and energy resources and a low quality of the architectural designs from the esthetic standpoint.

The decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Further Development of Industrialization and Raising Labor Productivity in Construction" (PRAVDA, 31 August 1985) is a most important document marking a qualitatively new stage in improvement of architecture on the basis of scientific-technical progress. As a practical matter the execution of this decree has already begun. We can point out as an example that at the present time plants of USSR Minmontazhspetsstroy and USSR Mintyazhstroy are manufacturing buildings of lightweight metal fabrications with a total floor space of about 10 million m^2 per year. The task has been set of sharply increasing the production of these building kits in the country by the year 2000. The principal task of architects and engineers in the new stage of extensive application of structural elements entirely made off site and mainly from lightweight metal fabrications is to solve all the problems involved in improving the quality of architecture and construction of such buildings. There is a need to define the area of their optimum and priority use, the space and layout parameters, and to standardize the elements and the architectural details.

Successful performance of this task will depend in large part on development projects of TsNIIpromzdaniy, Giprospetslegkonstruktsiya, and other organizations, and, of course, on the manufacturing plants as well. The buildings of lightweight metal fabrications known as "Modul" which are now being produced by enterprises of Minmontazhspetsstroy are in need of significant refinement both with respect to the space and layout parameters and also the architectural details. The building size, 30 x 30 or 24 x 72 meters, with a height of 6 or 8.4 meters, is limited and cannot meet the requirements of diverse types of production operations. Consequently, their extensive application could result in pushing the size of the building too far and unjustified functional and technical solutions. A more flexible system is needed for making up buildings that differ in their plan dimensions and in height. There is a great deal of creative and organizational work to be done in erecting buildings of lightweight metal fabrications.

Particular attention will be paid to fully prefabricated buildings of lightweight metal fabrications manufactured in kits for the agroindustrial complex--enterprises for processing and storage of farm products. TsNIIpromzdaniy is working on this problem together with Giprospetslegkonstruktsiya, PI-2, and others.

The decree of the CPSU Central Committee and USSR Council of Ministers referred to above has called for accelerated development of the construction fabrication industry and building materials industry, for a substantial increase in the output and application in construction of progressive materials and fabrications, and for a maximum increase in the degree of their off-site preparation. This means that our previous ideas and traditional methods of design must undergo radical reassessment. For instance, labor-intensive finishing operations will not as a rule be done at the construction site. Consequently, the designs of interiors and the external finishing of face walls, including the color scheme, must be included in the order specifications for all the structural elements to be delivered by the manufacturing plants--trusses, girders, deckings, wall and partition panels, doors, gates, and so on. This should reduce the amount of manual work in construction by at least 20 percent.

There is another extremely important aspect. The machinebuilding ministries manufacturing equipment must deliver their products to construction sites in integrated unit versions and assemble the equipment into larger units at their own plants. At construction sites of enterprises in a number of sectors the delivery of production equipment in large units with a high degree of factory preparation is to begin in 1987. Here again the architects will have to be involved. There is a need to think over and deliver to the manufacturing plants the color scheme for the consolidated equipment in view of the future interior of the shops and the overall color scheme.

An important new direction in architectural activity is the expansion of production of mobile buildings of the stock type used in setting up construction sites and also buildings for auxiliary production purposes produced as complete units. Here again a new field of activity is opening up for architects in the direction of creating comfortable working and living conditions for construction workers in new areas being developed.

Buildings for auxiliary production purposes produced as complete units (compressor stations, pump stations, power substations, control and measuring stations, offices and employee facilities, and so on) must be delivered to construction sites in a completely finished state, which will speed up activation of the main production operation. Our architects have shown great understanding and responsibility in becoming involved in work on the new problem. After all, the buildings themselves and the components for them, are designed to be shipped by rail, river, highway, or air transportation, and they are not large. The basic module for them is 3 x 6 meters. But this module has to be used to create buildings diverse in their purpose and elements of the construction capability that can be "set up quickly" and provide all types of services to the construction workers. This affords a large economic and social benefit. Although the problem for us architects is a new one, we have still begun to work on it with great enthusiasm.

In June 1986 the exhibit "Mobile Buildings" will be set up for the first time on the main grounds of the USSR Exhibition of Achievements of the National Economy. This indicates the great importance being given to the new direction of industrial methods of construction and to mobile and complete-unit buildings in particular. It is important that we architects cope honorably with the new direction in fully prefabricated construction and perform the tasks of architectural esthetics along with the others.

Cases are encountered in practice when a fully prefabricated production building of lightweight metal fabrications is built in a few days or weeks, but it cannot be activated because the accompanying services are not ready--compressor, pump, repair, auxiliary, and other rooms. We are now working in TsNIIpromzdaniy so that not only individual buildings, but indeed entire enterprises and the entire plant complex are activated quickly and at minimum inputs of labor. This effort must be made above all by architects, but, of course, all related specialties in all institutes must participate.

These are the main tasks which architects face in the context of applying new fabrications and building methods. New design methods, new versions of

architectural designs of buildings made of lightweight metal fabrications, and their architectural details must accordingly be developed. It seems we also need state standards that would guarantee high quality of workmanship in erecting such buildings to meet the level of a product of machinebuilding.

There is also considerable creative work to be done in improving the architecture of buildings from reinforced-concrete fabrications, which have now become traditional. The list of prefabricated reinforced-concrete structural elements now being used in industrial construction, which also determines the shape of industrial buildings, is being periodically updated so as to take into account the advances of engineering thought and scientific research of institutes--NIIZhB, TsNIIpromzdaniy, and many others. But wall panels, which give shape to the external outline of buildings, and their geometric parameters have not changed for 30 years. The technology in manufacturing the panels has clearly become out-of-date. It does not allow variability, and there are no plastic elements, no architectural details, no texture.

Use of ribbed vertical wall panels, which was done on the initiative of designers and builders in building the Krasnoyarsk Heavy Excavator Plant (Promstroyproyekt, Glavkrasnoyarskstroy), is a rare exception. Similar work with vertical panels is being done by Litpromproyekt, Belpromproyekt, etc.

The degree of use of manual labor, especially in finishing work, is very high in erection of buildings from reinforced-concrete fabrications. On behalf of increasing the degree of off-site preparation and improving the quality of architecture and construction there should be a reassessment of the requirements for the external "commodity" appearance and finishing of all structural elements of buildings produced at plants.

It seems to us advisable to submit to USSR Gosstroy for its consideration the question of applying the following measures to exert economic pressure: adoption of supplements (not to exceed 30 percent) to wholesale prices for progressive fabrications and reductions (also not to exceed 30 percent) of wholesale prices for fabrications which are to be withdrawn from production for architectural reasons. The supplement should be applied, for example, to vertical panels of outside walls, and the reduction to panels of outside walls representing outdated designs. It is well known that such penalties were envisaged in the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Measures To Accelerate Scientific-Technical Progress in the Economy" and by an order to that effect issued by USSR Gosstroy.

Elements of wall panels need to be manufactured according to a flexible technology and standard elements need to be supplemented with nonstandard elements. The external appearance of buildings should be created in accordance with the idea of the designer-architect using the off-site production capability, for each major region or individual complex, using a variety of supplemental elements. We hope that this will become indispensable as scientific-technical progress is integrated with the creative and artistic principle in capital construction.

There are several directions that represent exceedingly important areas of untapped potential for a further radical increase in the economic and social effectiveness of the science of architectural typology. Optimum and differentiated location of industrial enterprises so as to take into account their characteristics from the standpoint of public health and use in many production operations of waste-free technologies and the creation of integrated production and residential complexes will be able to guarantee an immense social and economic benefit. People will save time going to and from work. Many "clean" production operations can be located within walking distance of housing, and outlays can be reduced for organizing municipal transport and utility connections.

There is a need to improve the standard models of industrial buildings so as to take into account application of the advances of scientific-technical progress to technology, automation, and robotization, making provision for the possibility of rapid modernization of production operations without expenditures for the structural design of the buildings.

The research in the field of architectural typology being conducted along these two lines by TsNIIpromzdaniy under the program for Scientific-Technical Problem 0.55.01 jointly with sector institutes and specialized institutes produced a confirmed economic benefit of about 40 million rubles in the 10th Five-Year Plan and 134 million rubles in the 11th. When expenditures actually made for the research are taken into account, the effectiveness of the science of architectural typology turns out to be many times greater than for any other applied science.

Improvement of the social services to the workers at enterprises and esthetic improvement of the workplace, by ennobling work still more, elevate man and give beauty to his everyday life.

7045
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INDUSTRIAL CONSTRUCTION

BRIEFS

PILE TYPES IN NORILSK--Norilsk is a major center of construction in the Far North where every year 180,000-200,000 m^3 of concrete are cast in place in concrete and reinforced-concrete structures. Cast-in-place concrete and reinforced concrete are one of the principal buildings materials for erecting foundations and structural elements of the underground portions of buildings and installations. When foundations go to depths not exceeding 5 meters they are made from cast-in-place concrete in the form of separate columns, and when they are deeper than 5 meters the foundations of civilian, public, and industrial buildings have since 1964 been done in the form of precast piles dropped in drilled holes, piles cast in drilled holes, and precast piles grouted in place fitted tight in bedrock, and also "floating" piles which take advantage of the lateral forces of freezing. [Excerpt] [Moscow PROMYSHLENNOYE STROITELSTVO in Russian No 5, May 86 p 23] [COPYRIGHT: Stroyizdat, 1986] 7045

ON-GROUND STEEL ASSEMBLY--Specialists of the construction and installation administration of the trust Yuzhstalkonstruktsiya" are assembling reinforced-concrete skeletons of buildings of a large medic l complex 2.5-fold faster than usual. For the first time in the autonomou republic they have been assembling large structural elements on the ground. Then with a large crane they raise them to the building, where installation operations are completed. An I-beam structure hovers over the middle of the area where the units are assembled. In its openings the assemblers install three reinforced-concrete columns in a vertical position one after the other, and the welding of the attached parts begins. [Excerpt] [Moscow PRAVDA in Russian 24 Mar 86 p 1] 7045

FAST BUILDING METHOD--A building method making it possible to rapidly assemble reinforced-concrete buildings intended for power, industrial, and warehouse facilities from aggregated assembly elements (sections) with a high degree of off-site readiness has been developed in the experimental production and technical enterprise of Energotekhprom of USSR Minergo. The section consists of two 3-ply ribbed wall panels (with insulation) and roof slab. Large-panel reinforced-concrete slabs are used as partitions. The section's span is 12 meters, its height is 6 meters, and its weight is 6 tons. The section principle on which the new assembly scheme is based makes it possible to reduce to less than one-seventh the number of elements for assembly as compared to erecting a skeleton and putting up panels. Metal consumption is reduced by 10 percent, inputs of labor are reduced to one-third, and the share of manual labor is reduced by 40 percent. [Text] [Moscow STROITELNAYA GAZETA in Russian 28 Mar 86 p 3] 7045

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CONSTRUCTION, MACHINE BUILDING MINISTER ON NEW PLAN

Moscow STROITELNYYE I DOROZHNYYE MASHINY in Russian No 2, Feb 86 inside front cover

[Article: "In the Collegium of the Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] "]

[Text] In meeting their socialist obligations for a worthy greeting to the 27th CPSU Congress, branch collectives have, by strenuous labor, succeeded in carrying out the assignments of the concluding year and the 11th Five-Year Plan as a whole and have created conditions for successful work in 1986 and in the 12th Five-Year Plan. The ministry prepared its production associations, enterprises and organizations in advance for the transition, as of 1 Jan of this year, to a two-link system of management and operation under experimental economic conditions involving broader industrial enterprise rights and increased enterprise responsibility for production activity results and achieving, on that basis, higher labor end results.

Work results in the 11th Five-Year Plan and branch tasks in light of the resolutions of the October (1985) CPSU Central Committee Plenum on "Basic Directions of USSR Economic and Social Development in 1986-1990 and Up To 2000" were discussed at an enlarged joint meeting of the collegium of the Minstroydormash and the Central Committee Presidium of the Heavy Machine Building Workers Trade Union. Taking part in the work of the collegium were CPSU Central Committee, USSR Council of Ministers, USSR Gosplan and Gosstroy officials, ministry supervisory personnel, general directors, directors, party committee secretaries and chairmen of the trade-union committees of branch scientific-production and production associations and enterprises.

Minister Ye. A. Varnachev gave a report in which he noted that the ministry had fulfilled the 11th Five-Year Plan ahead of schedule in terms of total annual indicators for industrial output volume and marketing by 19 and 5 Dec 85, respectively.

More than 360 million rubles worth of output was marketed above the annual plans, providing the national economy with an additional 750 bulldozers, 80 wheeled and special-chassis cranes, 290 elevators, and other products. Consumer goods and household appliances production increased 2.4-fold. Labor productivity rose 29.7 percent, and the ministry provided the entire increment in production through increased productivity. The proportions between labor productivity and wage growth were observed.

Work continued in the 11th Five-Year Plan on improving the products mix and quality of the machinery, equipment and mechanized tools produced. About 600 new items of industrial output were put into series production and more than 500 items were modernized. Some 490 obsolete machines were withdrawn from production. The proportion of output in production for 10 years or more dropped from 28.8 percent in 1980 to 15.5 percent in 1985. Many types of equipment were put into production for the first time in the USSR.

The proportion of output with the state Emblem of Quality was 33.7 percent in 1985 (as against 28.8 percent in 1980). Branch production potential increased thanks to accelerated rates of retooling existing enterprises and the allocation of a large part of the capital investment to that; steps were taken to improve the use of production capacities, material, labor and financial resources. Serious attention was paid to questions of the social development of production collectives. During the 11th Five-Year Plan, the branch put 1.193 million square meters of housing into operation, along with dining hall seating for 6,094 and children's preschool institution space for 8,775. Working conditions were improved for 50,000 workers and 4,800 workers were freed from physically demanding and hazardous jobs.

Brigade forms of labor organization and wages were further developed in the branch. Over the five years, the number of brigades increased 1.4-fold, including a 1.9-fold increase in multipurpose brigades and a two-fold increase in integral-process brigades. Currently, 73.1 percent of all workers are grouped into brigades.

The report paid considerable attention to shortcomings in the work of the ministry and to analyzing the reasons for them. Individual production associations and enterprises have failed to meet annual plans for production and marketing in physical terms, for labor productivity and profit growth, and for reducing the net cost and improving the quality of the machinery and equipment; shortcomings have been permitted in contract deliveries. Leaders of the Tuymazinskiy Cement Mixers Plant, the Berdyansk Roadbuilding Machinery Plant, the Balakovskiy Self-Propelled Earthmoving Machinery Plant and the Ivanovskiy Peat Machine Building Plant were seriously criticized for systematically failing to carry out assignments on producing new output, as were leaders of the Uchalinskiy Timber Machine Building Plant, the Krasnogorskiy Cement Machine Building Plant, and other enterprises, for failing to carry out assignments on producing reference series of new machines. There was criticism of the poor quality of individual types of machinery and equipment produced by branch plants in the 11th Five-Year Plan, and attention was also focused on other shortcomings in branch work which must be eliminated in the 12th Five-Year Plan.

Comrade Ye. A. Varnachev noted that commodity output volume increased by 4.5 percent in 1985. Above-plan output worth 107.5 million rubles was marketed. More than 260 million rubles worth of consumer goods was produced. Collectives at the "Pnevmostroymashina" plant imeni Ordzhonikidze, the "Stroygidravlika" plant in Sverdlovsk, and other enterprises worked well. However, not all collectives were able to mobilize the available reserves and meet production assignments. A number of production associations and plants failed to meet assignments in terms of individual indicators. The national economy did not receive the expected numbers of graders, tower cranes and municipal services

machinery. This was foremost the fault of the leaders of the Bryansk Roadbuilding Machinery Plant imeni 50th Anniversary of Great October and the Mtsensk and Sverdlovsk municipal services machinery plants.

The output marketing plan was only carried out by 98.3 percent in terms of meeting contractual obligations.

The report and the speeches by participants at the enlarged collegium examined branch work in 1985 and in the 11th Five-Year Plan as a whole in detail and outlined steps to eliminate the shortcomings. There was a serious discussion with leaders who had permitted disruptions in the operation of their enterprises. The collegium took into consideration explanations of the reasons for the unsatisfactory work, set specific timetables for eliminating them, and demanded radical improvement in enterprise operation.

The collective socialist obligations for the associations, enterprises and organizations of the Ministry of Construction, Road and Municipal Machine Building for 1986 were adopted at the collegium meeting. It is anticipated that commodity output production will increase by six percent. Output worth 25 million rubles will be marketed in addition to the State Plan assignment. Reference series of new machines will be produced in 43 types, including: the single-scoop EO 4125 excavator, with an economical hydraulic drive system; the 40-ton shortbase KS-6371 crane; the ETR-208 screw-conveyor excavator, with a 162-kW motor, and others. Plans call for comprehensively mechanizing 59 shops and sectors. Some 15 million kilowatt-hours of electricity, 30,000 Gcal of thermal energy and some 1,700 tons of conventional fuel will be saved over the established assignments. Higher obligations were set for resolving social questions.

The collegium expressed its confidence that branch labor collectives would apply all their strength, skill and experience to successfully meeting the socialist obligations assumed here.

11052
CSO: 1821/157

CONSTRUCTION MACHINERY AND EQUIPMENT

UDC 621.873.15(083.74)

NEW SERIES OF PILLAR CRANES DESCRIBED

Moscow STROITELNYYE I DOROZHNYYE MASHINY in Russian No 4, Apr 86 pp 10-11

[Article by Candidate of Engineering Sciences L. A. Nevzorov and Engineer G. N. Pazelskiy (TsPKB [Special Design-Development Office for Elevators]): "A New Series of Pillar Construction Cranes"; capitalized passage printed in boldface]

[Text] Minstroydormash [Ministry of Construction, Road and Municipal Machine Building], with the help of USSR Gosstroy's TsNIIOMTP [Central Scientific-Research and Experimental-Design Institute for the Organization and Mechanization of and Technical Assistance to Construction], has developed a new parametric series of pillar cranes, based upon a comprehensive analysis of trends in pillar-crane development in the USSR and abroad.

The parametric series has been cut from 11 (under the existing GOST [State All-Union Standard] 13555-79) to 7 model sizes (see the table), facilitating the production and operation of the cranes and shortening the lists of unified components and spare parts.

The new series, while retaining the former load-moment values, has raised the load capability, reach, lift height and speed of operating motions. Use of the modular principle in creating the cranes will enable a practically unlimited number of versions of the cranes, which are distinguished by method of installation (mobile, stationary, attached and universal cranes), length and type of boom, height of lift and load capability, which will allow the builders' demands to be met to the greatest extent on the basis of a limited number of standard sizes (the base models).

All the base models of cranes for large-scale housing construction are to have a beam jib, thanks to which the cranes' productivity is increased by 10-15 percent.

The new parametric series of pillar cranes was introduced in GOST 13556-85, "Pillar Construction Cranes. Specifications," which becomes effective 1 January 1987. This standard has been broadened to include the parameters and technical requirements and the methods for testing pillar cranes and unified mechanisms. It was developed to replace GOST 13555-79, "Pillar Construction Cranes. Basic Parameters," GOST 13556-76, "Pillar Construction

Indicator	Standard crane sizes						
	With beam jib					With lifting jib	
	I	II	III	IV	V	VI	VII
Nominal load moment, ton-meters	100	160	200	250	400	630	1,000
Load capacity, tons:							
At maximum reach	3.5	6	6	6	10	14	16
Maximum	8	10	12.5	12.5	25	40	50
Reach, meters:							
Maximum	25	25	32	36	36	40	45
At maximum load capacity	12.5	16	16	20	16	16	20
Lifting height, meters:							
At maximum reach	32	45	45	63	50	50	50
Maximum	40	56	45	80	50	80	80
Depth of lowering at minimal reach, meters	5	5	5	5	5	8	8
Speed, meters/minute:							
Lifting of maximum-weight load	15-38	19-38	30-48	30-60	15-30	7.5-15	6-15
Lifting or lowering) of hook suspension with doubled lifting tackle	30-75	30-96	48-192	96-192	75-192	12-60	12-60
Smooth landing of maximum-weight load	4.8	4.8	4.8	4.8	3	1.92	1.92
Load-carriage movements with maximum-weight loads	24-38	24-38	24-38	24-38	30-48	-	-
Crane movements	15-38	15-38	15-38	12-38	12-38	9.6-19.2	9.6-19.2
Rotating frequency, rpm	0.75	0.6	0.6	0.6	0.48	0.24	0.19
Calculated wheelforce on the rail, kN	300	300	300	300	300	300	300
Rear clearance for cranes with rotating pillar, meters	3.6	4.5	-	6	-	-	-

Cranes. Technical Requirements," GOST 17009-71, "Pillar Construction-Crane Mechanisms. Technical Requirements," and GOST 17323-72, "Pillar Construction Cranes. Testing Methods," the dates of effectiveness of which have been extended to 1 January 1987.

The parametric series of cranes has been supplemented under the new GOST by such indicators of energy and resources savings as specific-energy intensiveness and specific weight, which will enable cranes with higher specific indicators to be excluded from production.

The GOST stiffens the requirements for reliability indicators: crane operating time before first overhaul has been raised by 11 percent and, for cranes with load-lifting capability of more than 25 tons, to 18 percent. In this case, for the first time, the standard introduces differentiated quality indicators (operating life, coefficient of technical efficiency, and mean time between failures), which enable the engineering level of the cranes to be raised; and operating time before first overhaul of cranes with load-lifting capabilities of less than 25 tons will be 10,000 machine-hours, or 13,000 machine-hours for cranes with load-lifting capability of more than 25 tons.

In the new standard, operating time is given in accordance with the 4K* group regime under GOST 25546-82, "Load-Lifting Cranes. Operating Regimes," which corresponds to a total number of crane-operating cycles of $2.5 \cdot 10^5$ during the period of its service where the workload factors is less than 0.25, or $5 \cdot 10^5$ where the workload factor is 0.125. In this case, the service period of cranes is adopted as: 10 years for cranes of less than 10 tons of load-lifting capability and 16 years for cranes with more than 10 tons of load-lifting capability where they operate on 1.5 shifts.

Load-hoist operation counters have been installed on all the cranes. The operating time (or service life) of a crane and of other machinery is determined by multiplying the counter's indications by the coefficients: 3.3 for the crane as a whole; 1 for the carriage hoist and turning mechanism; 0.85 for the undercarriage; 0.5 for the boom hoist; and 0.4 for the operator's elevator. The installation of an operator's elevator, which will be accepted for operation together with the crane as a component part of it, is called for on new cranes (except for size model No 1). For this purpose, the GOST introduces a chapter on requirements for the design and safe operation of the operator's elevator that was worked out in cooperation with USSR Gosgortekhnadzor [State Committee for Supervising Safe Conduct of Operations in Industry and for Mine Inspection of the RSFSR Council of Ministers], based upon "Regulations for the Installation and Safe Operation of Elevators."

The new GOST greatly expands the requirements for illumination for the working implements and the work area and the requirements for methods for testing cranes, for the measuring equipment and for proof loads. Realizing the indicated requirements will give the operators convenience during operations and will facilitate the conduct of crane tests.

*Corresponds to the light-duty regime under USSR Gosgortekhnadzor [State Committee for Supervising Safe Conduct of Operations in Industry and for Mine Inspection of the RSFSR Council of Ministers] Regulations.

THE INTRODUCTION OF GOST 13556-85 WILL ENABLE THE OVERALL TECHNICAL LEVEL OF PILLAR CRANES TO BE RAISED AND THEIR RELIABILITY AND OPERATING SAFETY TO BE ENSURED.

Questions on introduction of the new standard should be addressed to the TsPKB for Elevators (119048, Moscow, Ulitsa Usacheva, 24).

11409
CSO: 1821/164

CONSTRUCTION MACHINERY AND EQUIPMENT

UDC 621.876.113/.114

NEW GENERATION OF PASSENGER ELEVATORS DESCRIBED

Moscow STROITELNYYE I DOROZHNYYE MASHINY in Russian No 4, Apr 86 pp 11-13

[Article by Engineers Yu. M. Gershanik, V. G. Zhilenkov and V. A. Simonov (TsPKB [Special Design Development Office for Elevators]): "A New Generation of Passenger Elevators"]

[Excerpts] Major work done in recent years has enabled the technical level of domestic elevators to be greatly raised and serial production of standard passenger elevators of up to 1,600-kg load capacity and of freight elevators of up to 5,000-kg load capacity to be mastered.

The job of creating a new generation of elevators that are marked by reduced materials and power consumption and manufacturing and operating costs and by an increase in service life has been established.

A CEMA standard for parameters and dimensions of elevators, which the USSR has adopted, and GOST [State All-Union Standard] 5746-83, "Electrical Passenger Elevators. Basic Parameters and Dimensions," which became effective 1 January 1986, were developed to take ISO [International Organization for Standardization] recommendations into account. The main parameters for the new series of passenger elevators are shown in table 1.

The creation of elevators that meet the new GOST's requirements required the development of new engineering solutions and the development and use of outfitting items that are responsive to these solutions, necessitating, in turn, the involvement of a number of organizations in realizing them, including Minelektrotekhprom [Ministry of Electrical Equipment Industry], Minchermet [Ministry of Ferrous Metallurgy], Minavtoprom [Ministry of Automotive Industry], and others.

In order that this work might be done in timely fashion and with high quality, a scientific and technical program was established for creating and mastering the new generation of passenger elevators. Within the framework of this program, the TsPKB for Elevators worked out engineering documentation for 15 models of passenger elevators for housing and public buildings. The basic data of these elevators are shown in table 2.

Test series of these elevators have now been fabricated. Passenger elevators with a speed of 1 meter/second for housing and public buildings and with a

Table 1

(B) Показатели	(A) Основные параметры лифтов нового ряда для зданий																						
	(C) жилых				(D) общественных и промышленных																		
Грузоподъемность, кг (E)	400		630		400*	630		630			1000			1000**			1250			1600***		1600	
Вместимость кабины, человек (F)	5		8		5	8		10			12			12			15			20		20	
Номинальная скорость, м/с (G)	1,0	1,6	1	1,6	0,63	1	1,6	1	1,6	2,5	1	1,6	2,5	4	1,6	1	1,6	2,5	4	1	1,6	2,5	4
Высота подъема, м, (не более) (H)	60	85	60	85	70	45	65	45	65	100	45	65	100	150	150	45	65	100	150	45	65	100	150
Число остановок, (не более) (I)	16	25	16	25	10	10	16	10	16	25	10	16	25	25	30	10	16	25	25	10	16	25	25

* Только для промышленных зданий
** С проходной кабиной для транспортирования пожарных подразделений
*** Для лечебно-профилактических учреждений

A. Main parameters of new-series elevators for buildings.
B. Indicators.
C. Housing.
D. Public and industrial buildings.
E. Load-lifting capacity, kg.
F. Cage capacity, people.
G. Nominal speed, meters/second.
H. Lifting height, meters (not more than).
I. Number of stops (not more than).

*For industrial buildings only.
**With straight-through cage for transporting firefighting units.
***For hospitals and therapeutic institutions.

Table 2

(A) Индекс лифта	(B) Грузоподъемность, кг/скорость, м/с	(C) Виды зданий	(D) Размеры кабины (ширина×глубина×высота), мм	(E) Ширина дверей, мм
ПП 0401	400/1	(F) Жилые	1100×1000×2100	800
ПП 0406	400/1,6	(G) То же	1100×1000×2100	800
ПП 0601	630/1	— » —	1100×1400×2100	800
ПП 0611	630/1	— » —	1100×2100×2100	800
ПП 0621	630/1	— » —	2100×1100×2100	1200
ПП 0631	630/1	(H) Общественные и промышленные	1100×1400×2100	800
ПП 0606	630/1,6	(F) Жилые	1100×1400×2100	800
ПП 0616	630/1,6	(G) То же	1100×2100×2100	800
ПП 0626	630/1,6	— » —	2100×1100×2100	1200
ПП 0636	630/1,6	(H) Общественные и промышленные	1100×1400×2100	800
ПП 1001	1000/1	(G) То же	1600×2100×2300	1100
ПП 1011	1000/1	— » —	1100×2100×2100	800
ПП 1006	1000/1,6	— » —	1600×2100×2300	1100
ПП 1016	1000/1,6	— » —	[illegible]	[illegible]
ПП 1016 01*	1000/1,6	— » —	[illegible]	[illegible]

* С проходной кабиной для транспортировки пожарных подразделений

A. Designation of elevator.
B. Load capacity, kg, and speed, meters/second.
C. Types of buildings.
D. Cage sizes (width x depth x height), mm.
E. Door width, mm.
F. Housing.
G. Ditto.
H. Public and industrial buildings.

*With straight-through cage for transporting firefighting subunits.

speed of 1.6 meters/second for apartment houses have passed acceptance tests and series production of them has been recommended. Tests of elevators with a speed of 1.6 meters/second for public buildings are being completed. A pilot series of elevators with load capacity of 400 and 630 kg and a speed of 1 meter/second has been manufactured for apartment houses.

Increases in lift capacity and speed are characteristic features of the new-generation elevators. Elevators of 320-kg lift capacity with speeds of 0.71, 1 and 1.4 meters/second and of 500-kg lift capacity with speeds of 1 and 1.4 meters/second are the heaviest of the passenger elevators that are being produced. They will be replaced by elevators of 400 and 630-kg lift capacity and speeds of 1 and 1.6 meters/second, which will enable their throughput to be greatly increased.

A high degree of unification has been achieved in creating the new elevators. It exceeds 90 percent as a whole for the elevators developed, while for various components--speed limiters, arrestors and shaft doors--it reaches 95-99 percent. The cages of elevators of 400, 630 and 1,000-kg lift capacity are identical in width (1100 mm) and in door openings (800 mm), except for the PP-0621, PP-0626, PP-1001 and PP-1006 elevators.

The high level of unification and the modular principle of the design for the new type elevators enables the use of automated flow lines and robotics to be expanded, promoting an increase in labor productivity in elevator manufacturing, a shortening of the time taken to assemble the elevators, and a lessening of elevator operating costs.

The development of a new series of passenger elevators under GOST 5746-83, including elevators of 800, 1,250 and 1,600-kg load capacity and speeds of 1 and 1.6 meters/second, and of all elevators with speeds of 2.5 and 4 meters/-second, will be continued during the 12th Five-Year Plan and will be completed by 1990.

Introduction of the new passenger elevators into series production will yield great economic benefit. This will come to more than 100 million rubles per year for the mass production of elevators.

11409
CSO: 1821/164

CONSTRUCTION MACHINERY AND EQUIPMENT

BRIEFS

CONSTRUCTION-MECHANIZATION DESIGN INSTITUTE--Novomoskovsk--The All-Union Industrial-Design Institute for the Mechanization of Installing and Special Construction Work of USSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] has developed for the first time in the country a powerful crane with a load capacity of 250 tons. Its assembly was undertaken at Novomoskovsk's Azot PO [Production Association]. During the current five-year plan the institute's scientists and specialists are to develop 50 new machines, help enterprises to master the production of 30 new types of products that the institute has developed, including cranes with telescoping booms, and to modernize 16 machines and mechanisms. [B. Mikhaylov] [Text] [Moscow STROITELNAYA GAZETA in Russian 18 Apr 86 p 3] 11409

CRANE UTILIZATION DECREASES--Much has been written about the crane activity of our construction projects. It is a paradox that the number of pillar cranes for constructing housing and nonindustrial buildings has increased (about 30,000 units) but the utilization factor has been reduced. Because of the cranes' low mobility, the work involved in redeploying them from job to job, in laying the crane's tracks, and so on, is taking up an ever-increasing share of the total work volume. [Excerpt] [Moscow STROITELNAYA GAZETA in Russian 4 May 86 p 2] 11409

RZHEV TOWER CRANES--Rzhev, 4 [May]--Demand for Rzhev tower cranes is good among construction workers both here and abroad. They are very mobile, reliable and easy to operate. They are capable of lifting up to 10 tons to the height of a six-story building. While improving the technology and product quality, the crane-building plant collective has also improved quantity indicators. It has met in full all contract deliveries for the first five months of the year and has filled orders for three above-plan cranes. [By N. Popinako] [Text] [Moscow PRAVDA in Russian 5 May 86 p 1] 11052

CSO: 1821/157

USSR CONSTRUCTION MATERIALS MINISTER ON 1986 PLAN

Moscow STROITELNAYA GAZETA in Russian 27 Apr 86 p 3

[Unattributed article under the rubric "In the Collegiums of the Ministries": "By Means of Intensification"]

[Text] A collegium was held at the USSR Ministry of the Construction Materials Industry to review the tasks and primary measures for the implementation of the decisions of the 27th CPSU Congress. USSR Council of Ministers Deputy Chairman Yu. P. Batalin and CPSU Central Committee Construction Department Sector Chief P. P. Zolotov participated in the work of the collegium. Minister S. F. Voyenushkin presented a speech.

At the present time, noted S. Voyenushkin, positive changes have become apparent in the work of the sector. The enterprises have successfully completed the plan for the first quarter on the overall volume of realization of production, production of basic types of materials and products, as well as consumer goods, and growth of labor productivity. At the same time, the volume of industrial production has increased by 9.1 percent as compared with the same period last year.

Nevertheless, the Estonian SSR Ministry of the Construction Materials Industry and Glavzhelezobeton [Reinforced Concrete Main Administration] have not met the March plan for realization of production. On the whole, the construction materials industry has not fulfilled the March plan for the output of polished glass, porous fillers, and lime powder.

The collegium has outlined specific means for eliminating these shortcomings. The cardinal restructuring of economic work in the sector has been designated as the most important task. In two month's time, a program will be developed and approved for ensuring the profitable operation of all plants, reducing nonproductive expenditures, curtailing losses due to poor workmanship, effectively utilizing funds for repair of equipment, developing price formation and strengthening the effectiveness of cost accounting.

12322
CSO: 1821/151

CONSTRUCTION METHODS AND MATERIALS

JANUARY CEMENT PRODUCTION FIGURES SHOW IMPROVEMENT

Moscow EKONOMICHESKAYA GAZETA in Russian No 4, Jan 86 p 4

[Article by Yu. Ivanov: "Cement"]

[Text] In the first 10 days of January, the enterprises of the cement industry have produced 270,000 more tons of cement than in the same period last year, and almost 100,000 more than in the last 10-day period of last year (see table).

We must note that this significant increase and improvement in the work indicators has been ensured not only by such enterprises as the Karagandatsement Association, the Ust-Kamenogorskiy and Chimkentskiy Plants in Kazakhstan, the Akhangaranskiy and Navoiyskiy Plants in Uzbekistan, and the Mordovtsement Association, which had fallen behind in the past, but also by the reliably operating enterprises--the Karachayevo-Cherkesskiy, Sebryakovskiy, Belgorodskiy, Spasskiy, Lipetskiy, Karadagskiy Plants, and others.

Now it is important to secure that which has been achieved and to accelerate the pace which has been set.

We must take all measures to correct the work of the Checheno-Ingushkiy, Kuznetskiy, Kunane-Kunda Plants, and a number of others who are still falling behind. We must work more persistently with our counterparts on questions of continuous supply of cement plants with fuel, raw materials, and transport. In the collectives we must intensify the struggle for bringing about proper order in production, reducing losses of material resources and work time, and ensuring overall economy of fuel and electrical energy.

INCREASE IN CEMENT PRODUCTION FOR THE FIRST 10-DAY PERIOD OF JANUARY 1986 AS COMPARED WITH THE FIRST 10-DAY PERIOD OF JANUARY AND THE LAST 10-DAY PERIOD OF DECEMBER 1985 (Thousand tons)

	by 1st 10-day period in Jan. 1985	by 3rd 10-day period in Dec.
Overall for USSR Ministry of the Construction Materials Industry:	+271	+93
Including:		
for plants of union subordination	+115	+58
for plants in UkSSR	+19	+12
Uzbek SSR	+25	+11
Kazakh SSR	+57	+12
Armenian SSR	+7.8	+3.2

Today, questions of strengthening technological discipline, improving the grade value of cement, and significantly increasing the output of production of the highest quality category deserve particular attention. The success of these endeavors in the current year will also depend on how quickly the newly introduced capacities of the Rezinskiy Plant in Moldavia and the Nikolayevski, "lant in Lvov Oblast will be assimilated. The USSR and union republic Ministries of the Construction Materials Industry must constantly keep these questions in view, and must continue the persistent expansion of the introduction of energy-saving technological processes at the sector's plants. This includes processes associated with reducing the moisture content of slurry, large-scale application of ash and slag, etc. It is important to achieve an acceleration in the rate of construction and to ensure the timely operational introduction of new technological lines in Bryansk and Novorossiysk.

12322
CSO: 1821/151

CONSTRUCTION METHODS AND MATERIALS

UDC 666.940

RESEARCHERS DISCUSS TECHNICAL INNOVATION IN CEMENT INDUSTRY

Leningrad TSEMENT in Russian No 2, Feb 86 and No 3, Mar 86

[Interview series published by TSEMENT: "To Accelerate Scientific-Technical Progress in the Sector"]

[Feb 86 pp 6-8]

[Text] The journal TSEMENT continues to publish the responses to the questionnaire circulated by the editorial staff on questions of accelerating scientific-technical progress in the cement industry.

Speaking out in this issue are Professor T. V. Kuznetsova, doctor of technical sciences, and chairman of the department of chemical technology of binding materials, MKhTI [Moscow Order of Lenin and Order of the Labor Red Banner Chemical-Technological Institute imeni D. I. Mendeleyev]; V. S. Bogdanov, candidate in technical sciences and senior scientific associate at Belgorod Technological Institute imeni I. A. Grishmanov, and Professor V. D. Glukhovskiy, doctor of technical sciences and department chairman at the Kiev Engineering-Construction Institute.

THEY ARE RESPONDING TO THE FOLLOWING QUESTIONS:

1. What are the most effective scientific developments of the institute which have been introduced into production in the 11th Five-Year Plan?

2. What problems is the department collective working on to accelerate scientific-technical progress in the sector?

3. What must be done to increase the creative activity of our workers?

4. What stands in the way of the fastest possible introduction of scientific developments and inventions into production and how can we overcome the barriers existing in this matter?

T.V. KUZNETSOVA

1. Working in conjunction with Yuzhgiprotsement, our department's collective has developed methods for thermal activization of clinker formation. When this development was introduced at the Lipetsk Cement Plant, a 15 percent increase in the productivity of the rotating furnace was obtained. the specific expenditure of fuel for roasting was reduced, and the resistance of the fettling was doubled.

At the "Gigant" Plant (Voskresensktsement Production Association) and at the Ararat Cement-Slate Combine, a technology for the production of sulfate-containing portland cement with utilization of gypsum-containing by-products was assimilated. This increased the productivity of the furnace aggregates by 3-4 percent, and also improved the quality of the binding agent.

At the Kant Cement-Slate Combine, a stressing cement based on sulfoferrite clinkers is being developed at the recommendation of our technology department.

The compounds and technology for high silica cement (VGTs) for refractory lining of thermal aggregates in various sectors of industry have been developed. The production of this cement would make it possible to reject the import of expensive fettling materials.

New compounds of superplasticizers (SP) have been developed on the basis of products of condensation of sulfo acids of polynuclear cyclic and heterocyclic hydrocarbons with formaldehyde (N-1 and N-2). The necessary technical documentation has been completed for their production. The raw material for this production are high boiling point (anthracene) fractions of coal tar and pitch distillates.

2. Research has begun on new compounds of crystalline components which make it possible to increase the strength of cement stone by 70-120 percent in the early periods of hardening.

Our department and Yuzhgiprotsement continue to develop energy-saving technology for the production of portland cement clinker (P-roasting). The results achieved in the 11th Five-Year Plan will undergo further development and dissemination.

New types of special cements based on sulfoferrite-containing clinkers are being developed.

In-depth scientific research on the physico-chemical bases of clinker formation have led to the development of a technology of clinkers in liquate melts, whose assimilation is expected at certain cement plants. In this case, technogenic by-products act as the modifiers and catalyzers in the process of mineral formation.

Research is being conducted on the application of a new superplasticizer which contains up to 30-40 percent industrial lignosulfates. Work will continue on the rational application of new SP and on the application of N-1 and N-2 in the industry.

Oil-well cements of various function are being developed: heat resistant ones for elevated and reduced operating temperature conditions, and corrosion resistant ones against the effects of hydrogen sulfide environments.

Research will be conducted on developing technological means to improve the properties and physico-chemical bases of low-temperature technology of high silica cements.

Work is continuing on the synthesis of new aluminate and silicate phases, the study of the process of cement hydration with the application of YaMR [nuclear magnetic resonance] and other latest methods of research and related instrumentation, as well as on the study of defects in clinker mineral crystals and their effect on the hydration activity of cement. A technology for integrated processing of by-products of asbestos, phosphogypsum, concrete scrap, and other materials is being developed.

3. Much mental and physical effort is being expended on scientific research. Therefore, when this work ends in reporting alone, this brings no satisfaction. It is particularly unpleasant when an innovation which has a clear technical and economic effect is not introduced into production.

4. Most of the scientific developments require the reconstruction of individual sections or even technological lines at enterprises. The lack of financing of such work hinders the introduction of NIR [scientific-research work] into production, and sometimes completely blocks its path.

In order to improve this system, we must:

review the results of completed research by the Glavtsement commission and at scientific or scientific-technical councils of the USSR Ministry of the Construction Materials Industry;

include approved projects into the plan for introduction at specific plans. The responsibility for this must be distributed between the enterprise and the scientific subdivision proposing the innovation.

We must create a system of effective material incentives for the introduction of NIR, which is often hindered due to the absence of means for payment of appropriate remuneration. The enterprises have a general fund for encouraging the creative activity of inventors or innovators. Therefore, the introduction and payment of remuneration primarily concern only those innovations in whose development the workers of the enterprise have participated.

In order to assimilate the most effective proposals in production, it is necessary to include provisions for financing and supply of materials and equipment into the plan for introduction of the inventions. The remuneration paid to the authors should be handled in a centralized manner through the State Committee on Inventions and Discoveries.

Excerpts from my articles published in the journal TSEMENT No 3 and 5 for 1983, No 4 for 1984, and No 4 and 12 for 1985 have been used for this interview.

V. S. BOGDANOV

1. In the 11th Five-Year Plan, the collective of the department of mechanical equipment for enterprises of the construction materials industry at BTISMa [Belgorod Technological Institute imeni I. A. Grishmanov] has introduced energy exchange installations for cement mills: slanted interchamber partitions and, working in conjunction with NIItsement [State All-Union Scientific-Research Institute of the Cement Industry]--fettling with variable cohesion coefficient.

The slanted interchamber partitions (NMP) have been installed at the Karachayevo-Cherkesskiy, Starooskolskiy and Belgorodskiy Cement Plants, at the Sukholozhsk-tsement Combine, and the Spassktsement Production Association. These installations make it possible to reduce the specific expenditure of electrical energy in grinding cement by 25-30 percent, as well as to reduce the mass of grinding material loaded into the mill by 30 percent. This increases the operational reliability of the grinding assembly. The introduction of NMP at all the sector's enterprises would make it possible to ensure a savings of about 250 million kW·hr of electrical energy per year.

Fettling with a variable cohesion coefficient has been introduced at the Belgorodskiy and Karachayevo-Cherkesskiy Plants and the Mikhaylovtsement Production Association. They increase the service life of the grinding assemblies and increase the effectiveness of the pulverization process.

A pneumatic mechanism for regenerating the fabric of sleeve filters (PMR) has been installed on over 50 filters, including at the Sebryakovskiy, Karachayevo-Cherkesskiy Plants and the Krichevtsementnoshifer Production Association. This mechanism improves the quality, uniformity and effectiveness of regeneration of the expensive filtering fabric, and extends its service life by 2-3 times.

An industrial prototype of a combined three-stage dust catcher for the aspiration system of mill with dimensions of 3 x 14 m is being developed at the Belgorodskiy Plant. This assembly utilizes only 1/5 of the metal required for its analog.

2. All the projects of the department are performed according to orders from the USSR Ministry of the Construction Materials Industry (Glavtsement) in accordance with the integrated scientific-technical program.

The following are planned for introduction in the 12th Five-Year Plan:

energy exchange installations for separator and raw material mills (in conjunction with NIItsement);

systems, methods and technological processes for grinding clinker and additives under conditions of increased concentration of PAV [surface-active substances] in the zone of globe collision; the method has been tested under industrial conditions on cement mills with dimensions of 3.2 x 15 m.

The industrial output of cyclones (dust extractors) which we designed for industrial gas aspiration systems is planned in the 12th Five-Year Plan. It will be based at one of the industrial associations of the Ministry of the Chemical and Petroleum Machine Building Industry.

A method and design for an installation for deep dehydration of slurry has been developed. A laboratory prototype has been created which makes it possible to dehydrate slurry to 17-19 percent with a lower expenditure of energy as compared with analogous foreign methods.

All the installations and methods planned for introduction are protected by patents.

3. Recently, much has been written in the central press regarding the need for increasing and stimulating the creative activity of scientific workers. It is difficult to add anything new to this. Of the proposed measures, I fully support increasing the material interest of those who develop innovations, giving them preference in job advancement, and also creating and ensuring normal working conditions for the most active (not to mention talented) innovators.

After all, it is no secret to anyone that active inventors are not given support not only by the collectives of the sectorial scientific-research institutes engaged in the development of analogous questions, but even by the management of the enterprises and appropriate departments.

In recent years, our department has established good creative relations with the NIItsement Pulverizing and Grinding Laboratory. This relationship enriches VUZ science and brings it closer to the needs of production. However, even our joint efforts do not give the desired effect in accelerating the introduction of developments in industry.

Here the "effect" of interdepartmental decentralization is apparent in full measure. We need the interested aid of Minstroydorkommunmash [Ministry of Construction, Road and Municipal Machine Building] in manufacturing equipment.

The absence of our own base for manufacturing new types of basic technological equipment hinders our work. A thousand tons of equipment is planned for cement makers in Minstroydorkommunmash. The output of spare parts is planned according to this same principle. Again, the heavier these parts, the greater their energy consumption, the better for the suppliers.

Another bother is the currently existing system of planning and introduction of scientific developments for sectorial scientific-research by 5-year cycles.

For example, the following 5-year cycles have been defined for performing work in developing new types of equipment: the performance of research work; the development of technical documentation; the creation of an experimental semi-industrial prototype, followed by the creation of an experimental industrial prototype, an experimental industrial series with improvement of the prototype, and finally the output of the industrial series.

We must take measures to see that no more than 2 years elapses from the concept to the industrial testing of the innovation. Only in this case can we expect progress.

For the purpose of increasing the scientific level and practical significance of the work of sectorial scientific-research institutes, it is expedient to cardinally alter the system of financing. The entire volume of topics coordinated with the ministry must be directly financed through credit loans from the Gosbank. Then the completed projects, if their results are really significant, would be purchased by interested departments and enterprises, at the same time paying a mark-up for the ensured economic effect. Using these assets, the institute would then pay off its credit to the Gosbank, and the additional monies (the higher the level of the development, the greater the effect, the more expensive the completed project, i.e., the expenditures will be less than the income) would be channeled to future exploration work, the development of the institute's scientific base, etc. "Empty" scientific developments are a loss to the institute. Here, we believe, we can clearly see in fact how the scientific-research institute operates (without a persistent search for various, often fabricated indicators). If there is money in the bank account—there is success. If there is no money--the institute engages in paper shuffling. And then the inventions for the sake of the "check-mark" will not be developed and applied, but only those which give effect and increase the economic base of the institutes and enterprises.

4. If we speak of our sector, here we may rightly mention the criticism recently levelled at the Minstroymaterial for its conservatism in introducing energy- and resource-saving technology. The structural changes which have been introduced in the glavk services still unfortunately have not changed the rate of introduction of new technology.

We believe that the following measure would also be effective. At the decision of Goskomizobreteniye [State Committee for Inventions and Discoveries], effective inventions are passed down for mandatory introduction by those departments for which they are intended. Also, from the moment of recommendation the ministry must pay an honorarium to the inventor in accordance with the anticipated economic effect up to the industrial assimilation of the invention, after which the effect is recomputed. Then the ministries would solve problems of introduction with greater responsibility.

Undoubtedly, this proposal must be thoroughly worked out so as not to allow smart dealers to take advantage of science.

We must abolish as soon as possible the system of planning limits for enterprises according to that which has been achieved. It is this system which hinders scientific-technical progress, and not only in our sector.

Let me cite an example from one of our project developments. In 1984 a plant saved around 10 million kW·hrs, including at the expense of application of NMP [not further expanded]. For 1985 the limits for electrical energy were reduced accordingly for this plant, plus another 3 percent plan reduction. The plant found itself in a very difficult position: NMP are not

and in order to make them, it is necessary to seek out materials which are in short supply—rod iron, rolled fettling, and other materials. From this we may conclude: why should the plant economize on electrical energy if after 12 months it will be punished for this? Moreover, for this very reason it is not profitable for the plants to reduce the installation drive capacity.

Limits should not be removed from enterprises who have ensured an economy of material and fuel-energy resources through introduction of innovations until the new equipment is series manufactured.

It is expedient to isolate a group of leading plants which have a base for testing new developments, and to test a certain type of basic technological equipment or process at each one of them.

Such work must be provided by the state plan and valued in the same way as the plan for cement output. If any of these enterprises wishes to introduce something new which is not provided for in the assignment, it does so at the expense of its own reserves (as is done at the present time).

Effective technology and equipment which have been worked out by the base plants under industrial conditions must be extended to all the sector's enterprises with mandatory introduction within established time periods.

At present, cement plants do not have services which would allow them to implement any significant introduction without detriment to their primary activity. I would propose creating services with an integrated brigade of fitters at all enterprises. This brigade would be intended only for the introduction of new technology (certain elements of such a service have been created at the Karachayevo-Cherkesskiy Plant). Another proposal would be to organize an All-Union Association according to the Tsemremont type for assimilation and promulgation of new engineering and technology.

Practical experience has shown the expediency of developing scientific-production associations with subordination of production to science.

It would not hurt our ministry to hold open competitions on solving the basic problems of cement production with mandatory premium payments to the best authors and introduction of developments which have won prices, as well as with subsequent publication of the results of this introduction.

We might recommend that TSEMENT more bravely support the authors of totally new, nontraditional ideas and developments. It is not necessary to present such articles for review by sectorial institutes. The decisions of the editorial staff should be enough to publish the materials under the heading of "On the Order of Discussion". This would facilitate the more rapid realization of the concepts in production.

The results of competitions on the introduction of new technology are systematically published in the pages of the journal. It seems to me that it would be no less current in the decisions of the USSR Minstroymaterial governing board to publish next to the leaders on this question also the names of the enterprises and the surnames of their managers who are not doing a good job of introducing innovations.

V. D. GLUKHOVSKIY

1. The Kiev Engineering-Construction Institute has developed new and effective building materials--slag-alkali concretes which have significant technical-operational advantages as compared with portland cement. The scientific developments on this problem have been illuminated in sufficient detail in the articles published in TSEMENT, No 3 and No 11 , for 1985.

In the 11th Five-Year Plan the USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises], USSR Minpromstroy [Ministry of Industrial Construction], USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources], USSR Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], KazSSR Council of Ministers, Ukrmezhkolkhozstroy [Ukrainian Interkolkhoz Construction Organization] and other departments have been given assigned tasks on the produccion of structures made of slag-alkali concrete in a volume of 700,000 cubic meters. The fulfillment of these tasks was coordinated with KISI [Kiev Engineering-Construction Institute] and controlled by the USSR Gosstroy [State Committee for Construction Affairs].

2. In order to ensure the widespread introduction of slag-alkali concrete in the 12th Five-Year Plan, in which the volume of its production is to be brought up to 4.5 million cubic meters, our institute's collective is performing work on expanding (with consideration for the builders' needs) the nomenclature of structures made of slag-alkali concrete of grades up to 1400, increasing the spheres of application of this concrete, and developing technological processes for manufacturing constructions and erecting buildings and structures made from it. There are plans to expand the raw material base of slag-alkali binding agents due to the application of alkali-containing by-products formed in various sectors of industry, as well as dump slags from nonferrous metallurgy and steel smelting, i.e., by-products which have not found sufficiently widespread application up to now.

There are also plans to expand the application of contact hardening cements in production. The binding agents in these cements are hydrosilicate disperse systems of a nonstable crystalline structure which condense at the moment of contact between their component parts into water resistant bodies of considerable strength.

These binding agents have an extensive raw material base and low energy consumption, since the storage conditions of the most plentiful by-products transported to dumps for water removal ensure their spontaneous change to a state in which they have the capacity for contact hardening (nepheline and bauxite slag from aluminum oxide production, high calcium ash from burning kukersite shale and brown coal from the Kansko-Achinsk coal basin, and many others).

Recommendations have been published for the application of these substances in road construction in Western Siberia. By-products containing mineral and organic acids may be introduced into the compounds of such binding agents. This would make it possible to eliminate their harmful effect on the environment.

The solution of these problems will make it possible to significantly increase the technical-economic effectiveness of slag-alkali concretes and contact hardening concretes and to intensify their application in production.

3. In order to increase the creative activity of scientific workers, it is necessary to ensure their interested participation in the development and introduction of progressive scientific topics.

A great help in developing the creative initiative of scientists in the sector may be the application of moral and material stimuli, program-target planning of scientific developments, and development of a mechanism for managing these programs devoted to serving the cause of their fastest possible introduction.

4. In order to increase the effectiveness of introducing scientific developments and inventions into production, it is necessary to organize a mobile system ensuring the direct interest of ministers, departments and individual enterprises in the fastest possible assimilation of leading scientific achievements.

Here, the primary measure must be the organization of such forms of management of introduction of scientific developments which would concentrate in the same hands the financing of performed research, the control over fulfillment of work stages, the evaluation of work quality by its executors, and their remuneration. This would include the rewarding of enterprises for introducing innovations, as well as the elimination of organizational and departmental disorders arising due to disunity of organizations participating in the introduction of the scientific developments. Often these organizations have the necessary authority, but are not interested in the end results of someone else's research.

The increased effectiveness of research work may be greatly facilitated by including this work in the number of vital indicators by which the results of plant economic activity and the fulfillment of plans and assignments for the development of science and technology are evaluated, as well as the allocation of material incentive funds to enterprises participating in the industrial assimilation of achievements in science and technology.

[No 3, Mar 86 pp 8-9] UDC 666.940

[Text] TSEMENT continues to publish responses to its editorial questionnaire on questions of accelerating scientific-technical progress in the cement industry.

In this issue, A. V. Kiselev, deputy director on scientific work, SibNIIproyekttsement , and N. P. Permigin, NIPIOTstrom [Scientific-Research and Design Institute on Purification Structures, Safety Technology and Labor Protection in the Building Materials Industry] laboratory director.

THEY ANSWER THE FOLLOWING QUESTIONS:

1. What problems is the institute collective working on to accelerate scientific-technical progress in the sector?

2. What must be done to increase creative activity of the scientific workers?

3. What hinders the fastest possible introduction of scientific developments and inventions into production and how can se overcome the obstacles existing in this matter?

A. V. KISELEV

1. The institute's plans for 1986-1990 provide for work on substantiating technological schemes for changing the Korkinskiy, Nevyanskiy, Chernorechenskiy, Teploozerskiy Cement Plants, as well as the Yakutpromstroymaterialy Production Association, over to the dry method of production.

The peculiarities of these enterprises, in most cases, are high moisture content, karst formations, alkali content of the raw materials, nonuniform composition, and unfavorable physical and mechanical properties. This presupposes the study and development of special technological measures. The different types of basic equipment used at these plants necessitates the development of individual technological schemes for each enterprise.

SibNIproyekttsement will soon complete work on the application of gypsum-containing by-products from the Urals and Siberia in the production of cement, as well as work on the broader application of ash-slag by-products, particularly in the plants of the Far East, and ash from the Kansk-Achinsk fuel-energy complex.

Work is continuing on increasing furnace productivity and reducing fuel expenditure on the basis of reducing slurry moisture content, utilizing superdilution agents, using the semi-wet method with application of flocculants, and utilizing secondary heat from exhaust gases.

Research is being conducted in conjunction with NIItsement on the development and assimilation of means of mechanization for cargo-handling and transport work and mechanization of unloading materials from bunkers and silos.

2. In order to improve the creative activity and labor effectiveness of scientific and engineering workers, we must first of all improve the planning of scientific-research and experimental-design work, and particularly the organization of its introduction. We must also increase the role of the coordinating and scientific-technical councils and improve the structure of the scientific subsections.

An urgent need is to provide the scientific-research institutes with new instruments and equipment, as well as to develop their test-experimental bases.

The responsibility and degree of interest of developers for the innovation and for the results of their labor must be increased, as well as for the selection and training of scientific and engineering personnel.

3. At the present time, we cannot consider the situation which has developed with the introduction of our innovations to be satisfactory. Many of them are not introduced or the times of their introduction are unjustifiably dragged out. For example, the manufacture and assimilation of test prototypes of a drilling-loosening complex and a strip filter for dehydrating slurry has dragged on for many years. Work on the application of dilution agents, heat exchange and burner installations, and application of industrial by-products, including ash and gypsum, is slow in being introduced. These hold-ups occur, as a rule, not because of technical reasons, but because of organizational ones. This is particularly true for the organization of series introduction.

Sectorial consolidated plans for the introduction of new technology are not being developed, while the plans for technical retooling of the sector provide for only an insignificant number of the available developments, requiring great capital investments.

The plant plans for introduction are generally lists for replacement of worn-out equipment or its insignificant improvement. Because of the additional bother and low degree of interest, the enterprise management, as a rule, is in no hurry to introduce the developments of the institutes.

Therefore, the introduction of new technology is generally represented only in the order-job authorizations to the institutes. Often it is not even coordinated with the plants and is not organizationally or materially ensured of fulfillment. In other words, a situation arises whereby the developer becomes both the customer and the executor for introduction of the new technology.

As a rule, innovations developed in recent years must be perfected in experimental production and require the development of instrumentation, assemblies, installations, etc. The possibilities of the cement plants in this respect are extremely limited, and the experimental bases of the institutes are of low capacity.

In order to organize widespread introduction, it is expedient to centralize the manufacture of small-scale technology, as well as to organize test-experimental sections based at the Tsemremont trusts and working on orders from the institutes and plants.

The material-technical provision of introduced developments is extremely complex. The practically existing order for material provision of new technology at the expense of material resources allocated to plants for operational or repair needs or through the territorial Gossnab [State Committee for Material and Technical Supply] is not very effective. There are great difficulties in implementing the introduction of current technological processes with the application of new complementation equipment and fund materials which are nontraditional for the plants. In our opinion, we must

develop long-term sectorial plans for material-technical provision of the introduced measures with first order of fulfillment. Also, the sector's managers must more actively resolve organizational and interdepartmental questions.

N. P. Permigin.

1. The basic direction of NIPIOTstrom is aimed at questions of dust extraction of high temperature aerosols, as for example the excess air from clinker coolers and furnace gases from the dry method of cement production. Working in creative cooperation with other scientific-research organizations, we are conducting exploratory work on the development of frame-fiber filters based on asbestos-basalt woven and nonwoven materials.

The development of rotary granular filters implemented in conjunction with the Uralmash Production Association and the special design buro on labor hygiene (Kiev) is of some interest.

In the future is the development of highly effective wet purification dust catchers of type PVT. The apparatus of this class will make it possible to solve certain problems in dust extraction from rotating furnace exhaust gases.

2. The currently existing system of wage payments does not fully facilitate an increase in the creative activity of scientific workers.

3. The environmental protection work of our institute is significantly hindered by the absence of a test-experimental base and a testing plant. We have completed project developments which have been approbated under industrial conditions and which have proven themselves well. If NIPIOTstrom were to organize their production at an experimental-industrial base, it would thereby be able to give significant technical aid to the sector's enterprises in introducing dust catching systems, means of collective protection, normalization of the microclimate at work sites, reduction of noise and vibration, as well as aid in the mechanization of heavy manual labor.

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BRIEFS

RECONSTRUCTION OF CEMENT PLANT--Will the Punane Kunda Cement Plant be reconstructed in the 12th Five-Year Plan? (Unified Political Day in Sillamyae). F. Rebane, chief of the capital construction section, ESSR Ministry of the Construction Materials Industry: "For the past 3 years work has been actively performed on retooling the Punane Kunda Plant. Much of the outdated equipment has been replaced. In the 12th Five-Year Plan the reconstruction will continue on this enterprise which supplies cement and slate not only to the construction sites of the republic, but the entire country as well. For this purpose, the state has allocated 4 million rubles in capital investments. Of these, 2 million have been allocated for construction-installation work. Already in the current year, 1 million rubles will be spent on the replacement of old equipment alone. Among the major facilities will be the installation of the new cement mill No 6. Its start-up will make it possible to increase the milling of clinker and to ensure the rhythmic operation of the cement furnaces, and consequently of the entire enterprise. Other sections of the plant will also be subject to technical retooling. A gas purification installation is being designed. A new electric filter will be mounted on cement furnace No 1. It is the start to the solution of a serious problem--purification of the air of gases and dust not only in the shops of the enterprise, but also in the entire city of Kunda. [Text] [Tallinn SOVETSKAYA ESTONIYA in Russian 19 Feb 86 p 3] 12322

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